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Contents of this Issue

From the Editor's Desk 5

Feature Articles—

Lacquer Solvent Balance is Vitally Important, by Ellis W. Coates.. 11
Finishing Mahogany Cabinets for Radios, by Frank Colby..... 14
Application of Air Filters to Product Finishing, by W. G. Frank.... 17
Tumble Finishing—II, by R. J. Fairburn..... 26
"New Materials and Equipment" Section..... 32
"Metal Finishing" Department..... 43
Finishing Rear Vision Automobile Mirrors, by L. G. Winkler..... 43
Porcelain Enamel Finishing Pipe Ells, by C. A. Wulf..... 48
Finishes for Radiator Covers, by Robt. G. Mudge..... 53

"New Materials and Equipment" Section 32

Mechanical Striper 32
Measures Viscosity Accurately..... 32
Glyco's "No Foam"..... 34
Air Separator 36
Pneumatic Sander; Polisher..... 36
Oil-Fired Oven Heater..... 38

"Metal Finishing" Section 43

"Questions and Answers" Section 61

Short Articles

Ceiling and Wall Sweating.... 12
Jackson Joins Hilo Sales Staff. 13
First Aid Catalog..... 13
Novelty Finish in Lacquer.... 16
Painters' & Finishers' Supplies 16
Protection and Decoration of Concrete 16
Meetings Scheduled Next Month 24
New Denatured Alcohol..... 30
Removing Finish from Aluminum 46
Industrial Oven Catalog..... 46
Worthington Sales Executives Hold Annual Meeting..... 52
Lacquer for Hats..... 57
Colors Popular for Automobiles 73
Fireproof Equipment 74
Opening Sealed Drums..... 74
Hercules Establishes Foreign Relations Department 74

Editorial 76

"Classified Advertising" Section 78

Advertisers' Index 79

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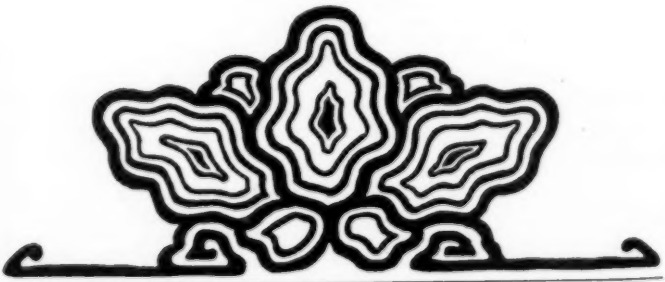

From the Editor's Desk

"WE HAVE FAITH in our merchandise and our prices." This message was sent out recently by a certain association of producers to all the trade buying its products, the idea back of it being a "step for the protection and promotion of trade confidence."

What a fine thing if all users of finishing materials would work energetically and conscientiously toward this ideal. Everyone can call to mind a number of nationally known products that are well established in the confidence of the general public. Why is this; and isn't it equally desirable that the products of smaller manufacturers should be also recognized—even though by a smaller number of customers and possible prospects—for unquestioned quality and dependability? The materials, equipment and methods are available for making the finish on manufactured goods all that can be desired.

* * * *

If manufactured products are to attract more new buyers and at the same time continue in favor with past and present customers, every manufacturer must continually strive to learn more about who is going to use his products, how they are being used, what new uses if any are being uncovered, and how the products might be improved in appearance and utility or adaptability to present and future conditions everywhere along the line.

Charted sales of paint, varnish and lacquer products for the past three years show that every year the sales volume rises very sharply from January to the middle of May; in 1928 it rose from 19 1/3 to 30 2/3 millions of dollars; in 1929, from 21 to 32 millions; and in 1930, from 18¼ to 27¼ millions. May was the peak month for trade sales in all three years, and for industrial sales in 1928 and 1929; last year April was the peak month for industrial sales.

* * * *

What importance is a salesman of finishing materials to his company and to the trade he calls on? The man who superintends production and buys materials for one representative concern makes this significant statement:

"We have two sources of supply for information, the trade journal and the right kind of salesmen. In fact it is firmly imbedded in my mind that the proper training of salesmen in a field such as the finishing materials product, is the most important feature of the manufacturer. The properly trained man helps everybody; the poorly trained man just hinders. The wideawake company should devote more time to these men in times such as this, and they will reap the harvest in the time to come."

W. H. Rohr

Managing Editor

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accomplished with

LINDOL-B

assures these advantages

Depth of finish	—	due to high refractive index of Lindol-B
Body	—	" " high specific gravity " " "
Flexibility	—	" " plasticizing ability " " "
Moisture resistance of film	—	" " Lindol-B being moisture repellent
Clarity and Hardness of film **Tensil strength** **Adhesion** **Minimum shrinkage**	—	" " blending ability of Lindol-B

Checking and cracking are eliminated and a permanence of the above properties is assured by the plasticizing power and the absolute non-volatility of Lindol-B.

LINDOL has stood the time test of service.

Tests

Purity — No darkening should occur when Lindol is treated with concentrated sulphuric acid.

Solubility — No cloudiness should occur when resin solvents are excluded from a clear lacquer.

Compatibility — Note the quantity of hydrocarbons necessary to cloud clear lacquers plasticized with Lindol-B.

Lacquer Manufacturers — We will be glad to submit samples, technical data and quotations upon request.

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Why, in its relationship to the drying film,

Lacquer Solvent Balance Is Vitally Important

By
ELLIS W. COATES

Lacquer chemist, servicing an inquiry about why a lacquer finish wrinkled, explains some interesting and significant facts about lacquer formulation to insure "progressive solvent balance" throughout the drying time of a finishing coat

I am pleased to attach a very brief treatise on some of the causes of failure attendant upon the lacquer finish. You will perhaps recognize that this data grew out of the complaint submitted by the H. M. Ocko Co. of Monsey, N. Y., which you transmitted to me in July of last year.—

Ellis W. Coates

STATEMENT of Type Problem: "We are having considerable trouble with our dipping lacquer which we apply to small wood turnings. Our difficulty is that the lacquer wrinkles while the film is drying. At times the wrinkles disappear before the film dries hard, while at other times the wrinkles remain, which absolutely ruins the finish."

There are two causes that suggest themselves in the case in point as expressed in the foregoing statement of facts.

1. Rapid evaporation of liquid component would cause a moist film to wrinkle in an effort to conserve a portion of the liquid constituent. As a rough analogy, we might compare this phenomenon with that of green vegetation that wrinkles (wilts) in order to conserve moisture during hot and dry periods or seasons. This is especially noticeable on leaves of growing corn during a drouth.

2. A heavily plasticized, high-viscosity solution might cause wrinkles due to application of too much material in a single dipping of the article to be finished. It is generally conceded that more satisfactory finishes are to be had by the application of two thin coats of material rather than one heavy coat. Instances arise, however, where

Many cases of failure of lacquer films to dry properly and give uniformly smooth protective coatings on any type of surface are traceable to imperfect solvent balance. It is therefore of paramount importance that solvents be so chosen as to maintain progressive solvent balance throughout the drying period. This may only be accomplished by exercise of care in solvent selection, based upon a full knowledge of technological aspects and subsequent effect during the various stages of drying, of each component and combination of components to be used in the system, coupled with intelligent application of the underlying physico-chemical principles of the drying film.

the value of the articles being coated are such as to make the use of a two-coat system prohibitive from an economic standpoint. The alternative procedure in such cases would be to reduce the solid material—nitrocellulose or gums, or both—per unit volume so as to give a film of such consistency as to be free of wrinkles on drying.

Evaporation of Solvents

Returning now to the first cause as listed above, I will present in some detail the several phases of reasoning that appear to be applicable. Having made a study of a formula as given me by a manufacturing concern encountering difficulty in the drying of films following the application of nitrocellulose finishes, I am convinced that too rapid evaporation of solvent is the primary cause of the troubles.

Applying the principles set forth in the "box" at the beginning of this article to the following solvent formula which may be taken as representative—

Toluene	50%
Ethyl Acetate	20%
Butyl Acetate	15%
Butyl Alcohol	15%

. . . . I desire to point out that the most active solvent, ethyl acetate, is also the most volatile, and that its rapid evaporation exerts a dual effect upon the drying film; viz:

1. It cools the surface of the film coincident to its change of state (liquid to gaseous vapor) by absorbing heat units from the adjacent atmosphere. This cooling effect imparts to the moist and plastic film a contraction in volume, due to the normal shrinkage in volume of the liquid phase of the system upon passing from a higher to a lower temperature. Since this is a surface effect, it induces a tendency to wrinkle because the underlying portion of the coat does not change in temperature as rapidly as the outer layer, and they have practically the same coefficient of expansion or contraction, being of similar composition and body at time of application.

Cause of Wrinkled Finish

2. Wrinkles are also induced by the attempt of the film to maintain equilibrium with respect to its liquid components during this stage of drying by evaporation.

The ultimate effect of this series of changes is a wrinkled film, and consequently a spoiled finish. I wish to submit further that the wrinkles may not be attributed to any one specific cause, but that they represent the cumulative effects of several forces, all of which move, or tend to move, in the same direction. It seems entirely fitting that the causes of these adverse trends in the application of finishes should be grouped under the general terminology of "Improper Solvent Balance."

Lacquer Formula . . . Special

It is extremely difficult if not impossible to lay down a set of rules or conditions under which a given lacquer system can be expected to function properly because of the varying conditions that obtain in different sections of the universe. Such a formula would truly belong to the "Utopian Realm" of lacquers.

It is more nearly true that each lacquer formula for any given purpose, presents a special case oftentimes taxing the ingenuity of technicians and foremen finishers to the utmost. However, the versatility of the lacquer finish is such as to lend itself to ready adaptation to any type of finish job

under proper manipulation, and because of this fact, we are of the opinion that there is hardly a finish job that cannot be done as well, and in many cases more economically, by the use of lacquer than by the use of older types of finishes.

Summarizing, I have set forth in some detail the importance attached to solvent selection with reference to the maintenance of a "Progressive Solvent Balance" throughout the drying time of a finishing coat. I wish to record the thought that in my opinion, time spent in this connection in selecting and formulating lacquer solvents, will mean time saved in the finishing departments of consumers, finer and more enduring finishes, and better satisfied customers. Such a program would necessarily be sound from an economy standpoint and would reflect favorably upon the management and personnel of any organization engaged in the application of lacquer finishes to industrial products.

Ceiling and Wall Sweating

Advanced knowledge in building construction coupled with the correct use of a wide range of insulating materials and air conditioning equipment has almost eliminated the once troublesome condensation or sweating of ceilings and walls in finishing and drying rooms. Heretofore it was not uncommon for manufacturers to be seriously troubled with moisture collecting on ceilings in sufficient quantities to drip on products in process of finishing, or products stored in the drying room.

Sweating is caused when warm moisture laden air comes in contact with a colder surface, resulting in the latent moisture being precipitated on the colder surface.

The remedy is obvious. Due to acknowledged requirements of finishing as well as for the sake of workmen's comfort, the room air must not be cooled to the temperature of the ceiling and walls. Factories located in extremely cold climates should and probably do take advantage of some of the excellent insulating materials now on the market, to protect the ceilings of finishing and drying rooms from low temperatures.

In localities where extreme cold is uncommon, manufacturers have availed themselves of modern air-conditioning equipment such as thermostats, humidifiers, unit heaters and the correct principles of air circulation, thereby reducing ceiling and wall condensation to a negligible quantity, or eliminating it entirely.

Irrespective of the geographical location of the plant or climatic conditions, products stored in drying rooms, or work in process, may be adequately protected from damage by condensation through the proper use of insulation and controlled, circulated air.—G. Rice.

Jackson Joins Hilo Sales Staff

Mr. R. L. Jackson has joined the industrial sales staff of Hilo Varnish Corp., Marcy and Flushing Aves., Brooklyn, N. Y. Mr. Jackson will make his headquarters at the Hilo Chicago Plant and will work the Chicago industrial field from that location.

First Aid Catalog

The Mine Safety Appliance Co., Braddock Ave., & Thomas Blvd., Pittsburgh, Pa., has ready for distribution its M-S-A First Aid Materials Catalog No. FA-2. This catalog contains 35 pages, 7¾x10-in. in size, is illustrated, and has an index of First Aid materials.

Finishing Mahogany Cabinets for Radios

By
FRANK COLBY

Foreman finisher at Robert Mitchell Mfg., Co., Cincinnati, Ohio, describes the process used in finishing radio cabinets, the fronts of which contain mahogany and Sans-Arb over gum wood

MORE ELEMENTS enter into the successful finishing of mahogany, I believe, than any other furniture wood. For instance, it would be a serious error to declare that all mahogany is soft in texture and that therefore a finishing schedule designed exclusively for a soft wood will produce a satisfactory and durable finish. We are all aware that lumber and veneers sold for mahogany include many varieties of that well known family of woods, and that they are imported principally from Africa, and from South and Central America.

Only a comparatively small percentage is true mahogany. For this reason we are confronted with an assortment of woods varying in color from reddish brown to light pink and even straw-color, of different specific gravity and different texture. Some of the varieties have larger pores than others and the grain of one species is fairly straight, while that of others is interlocking.

Of course we cannot change our finishing schedule with the changing wood structure of the various lots, hence we have based our schedule on a very soft wood—a wood in which the stain penetrates deeply and obviously requires relatively more drying time than a wood similar in texture to American walnut.

We are especially careful in padding and wiping the filler. I have found that by spending a little extra care and time on the foundation or undercoats at the beginning of the process, in many cases we eventually save time and cost, and in all cases we produce a permanently satisfactory finish.

Because of the Sans-Arb ap-

plication on the front of the cabinet we are now making, it is necessary to bring the front up to the final coat of finish before it is assembled in the cabinet. The assembled front consists of a gum top rail, moulded mahogany side panels, and gum bottom rail—all in solid wood. Sans-Arb is applied to the entire top rail and inside the routed lines on the bottom rail.

Front frame before it is installed in cabinet.

The first operation in the finishing room consists of a spray coat of water stain, which is allowed to set for about ten minutes; then it is wiped with a sponge and permitted to dry for five hours. The front is then sanded with No. 5/0 sandpaper. A coat of paste wood filler is brushed on and allowed to set for 15 minutes, after which it is worked into the pores of the wood and wiped clean with rags. Then follows a 4-hour period of air drying.

A spray coat of lacquer sealer is applied and allowed to dry for an hour, after which it is sanded with No. 5/0 sandpaper. Then a coat of clear lacquer is sprayed on the entire front and allowed to dry over-night. It is understood the gum top rail does not receive the stain filler and sealer coats.

The two Sans-Arb applications are made by dipping the transfers into a welding cement and then applying them to the lacquered surface of the entire top rail, and inside the routed lines of the bottom rail. The transfers are rolled down firmly with a rubber roller, then trimmed around the edges. The paper cover on the Sans-Arb is removed and the protective tissue coating is washed off the transfer with clear water, and wiped dry. The front is allowed to stand over night to permit the Sans-Arb to dry out thoroughly.

The front is then delivered to the cabinet shop where it is installed in the cabinet (in the white) which is returned to the finishing department.

A coat of water stain is sprayed on the cabinet, with the exception of the front. This stands for ten minutes and is then sponged off and allowed to dry five hours. The water stained surface is sanded with No. 5/0 sandpaper. Next, a gum oil is applied to the fluted posts, leg carvings and end grain wood around the edge of the top. A brush coat of filler is applied to the top, allowed to set for 15 minutes and is then rubbed into the pores of the wood, and cleaned with rags.

After drying four hours the cabinet is shaded with a lacquer

On the filling line. These elevated slides support the cabinets at a convenient working height for the workmen.

shading stain, which is allowed to dry 30 minutes. Then a coat of lacquer sealer is sprayed on the cabinet. In about an hour the sealer coat is sanded with No. 5/0 sandpaper, after which a spray coat of flat lacquer is applied. This dries over night; then the top is rubbed with No. 320-A waterproof sandpaper, using a neutral oil as a lubricant. The cabinet is cleaned up and made ready for the upfitters and final inspection. Final touching up is done before the cabinet enters the packing room.

Novelty Finish in Lacquer

For the past few years many manufacturers have been using on their products the crystallizing and wrinkle finishes, which in most cases have been only partly successful insofar as being entirely trouble-proof. Crystallizing and wrinkle finishes are, of course, the bake-finish type, and the results are not always uniform in each bake or batch of finished work. However, it is possible to obtain novelty finishes in air-drying lacquer that work satisfactorily on either wood or metal.

One of these finishes to which I have reference is called the "web finish." A number of color effects, including two-tone, are obtainable with this finish. The material used is a heavy stringy white material that becomes very hard after drying. It is used directly from the container, sprayed from a gun with a spatter nozzle directly onto the bare surface, leaving a deposit of small, raised, stringy particles.

The size of the spatter particles are regulated by the air pressure; they can be varied from the size of a pin head to as large as a navy bean.

After air drying for one hour any color desired may be sprayed over the entire spattered and webbed surface. For this work a flat or semi-flat lacquer is recommended.

If a two-tone color effect is desired, a mist coat or shading spray coat of some contrasting color may be applied over the already colored surface by holding the spray gun at an angle to the surface, so that the shade color will strike the high spots of the spatter from one side. This produces a very striking effect.

This finish, when properly applied, will leave a rough but attractive finish, fairly smooth to touch with no burrs or sharp projections; neither will it harbor dust as do some of the novelty baked finishes.

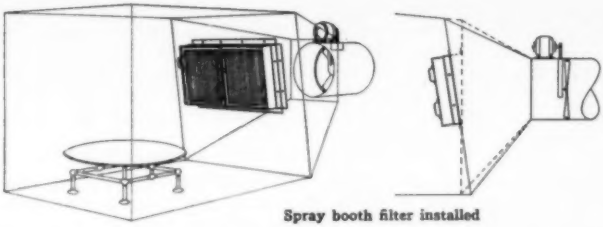
In my opinion this finish will produce very artistic effects, either light or dark, on wood or metal—polished or rough castings; it requires no baking, and is absolutely foolproof.—C. S.

Painters' & Finishers' Supplies

The Geo. E. Watson Co.'s Catalog No. 54 for painters' and finishers' supplies and brushes is now ready for distribution. It is 6¾ x 10-in. in size and may be obtained from the Watson Company, 164 W. Lake St., Chicago, Ill.

Protection and Decoration of Concrete

The D. Van Nostrand Co., Inc., 250 Fourth Ave., New York City, has published a 54 page, illustrated book about "The Protection and Decoration of Concrete" by Maximillian Toch. This book describes the painting and decorating of concrete, methods of neutralizing the lime in Portland cement concrete previous to painting, protection of concrete in chemical works, color decoration of concrete, painting cellar floors, decoration of concrete and wall plaster, and the influence of atmosphere. This book is 7½x5-in. in size and sells for $2.00 a copy.



Spray booth filter installed

Application of Air Filters to Product Finishing

By
W. G. FRANK*

Air filters offer a simple and practical solution to many of the problems of product finishing. They are used in spray booths to control surplus spray; in compressed air lines to remove entrained oil, moisture and dirt; in finishing rooms, drying rooms and baking ovens to eliminate dust and dirt

PRODUCT FINISHING usually involves two operations: (1) applying, and (2) drying the finish—each of which presents its own specific problems. Lacquer, unlike paint, enamel or varnish, requires no long drying operation, but its application often presents a much greater problem due to the unusual properties of this type of finish.

Spray Booth Filter

When products are finished by spraying, the work is usually done in special booths equipped with exhaust fans to carry the fumes and spray vapor outside the building. Spray vapor, because of its nature and volume, creates several serious maintenance problems, the three most important of which are:

1—Reduced fan efficiency, due to accumulation on fan blades.

2—Fire hazard, resulting from deposits in exhaust duct.

3—Unsightly, appearance caused by settling on outside walls.

A special air filter developed for spray booth service eliminates the spray vapor by removing it from the exhaust air before it reaches the fan and ducts. The large capacity of the Sinuous spray booth filter (1500-c.f.m. as compared with 800-c.f.m. for the standard unit) and the fact that no louvres or other pre-cleaner is required brings the cost of equipping a spray booth down to a point where it will now show a substantial saving in maintenance alone.

Installation

The filters are installed as shown in drawing at the head of this article, so that all the air

* Applications Engineer, American Air Filter Co. Inc., Louisville, Ky.

passes through them before reaching the fan and exhaust ducts. It is advisable to incline the filter forward 5° to 10° to prevent drops of spray collecting on the back edge of the baffles, which might be carried off in the air stream.

The Sinuous spray booth filter, (see Fig. 2) consists of a cell and frame. The frame is fastened permanently to a sheet metal partition at the back of the booth. The cells fit into the frames and are held in place by spring latches. Each cell has a capacity of 1500-c.f.m., and the number required for any spray booth is determined by the capacity of the fan; use one filter for fan capacities up to 1500-c.f.m.; two filters for 1500-c.f.m. to 3000-c.f.m.; three filters for 3000-c.f.m. to 4500-c.f.m., etc.

When filters are installed in a spray booth the amount of air exhausted may be reduced from 5% to 10% due to the resistance of the filters, if the fan is operating at or near its maximum rated capacity. It is advisable, therefore, to speed up the fan proportionately if the spray vapor is not exhausted as quickly as before the filters were installed. The air velocity at the front or open side of the booth should not be less than 85 nor more than 100-ft. per minute to secure best results.

Performance Data

Following are the results of a test made under actual operating conditions in a spray booth equipped with these spray booth filters.

Days of Operation	Wgt. of Paint Spray Accumulated	Air Velocity	Capacity In C. F. M.
0	0	630	1730
5	1-lb. 6-oz.	600	1650
10	2-lb. 10-oz.	570	1570
15	3-lb. 13-oz.	550	1510
20	5-lb. 0-oz.	520	1430
25	5-lb. 13-oz.	415	1140
30	6-lb. 3-oz.	156	430

Two types of finishes were used in about equal amounts: dark green air-drying enamel which weighed 2-lbs. 5-ozs. per quart, and black oil-proof lacquer weighing 1-lb. 4-ozs. per quart—making the average weight of the spray trapped by the filter 1¾-lbs. per quart.

At regular intervals the filter cell was removed and weighed to determine the amount of paint spray accumulated, and the air velocity through the filter was checked with a pitot tube. Note that the original capacity of the filter was 1730-c.f.m., an increase of 230-c.f.m. over its normal rated

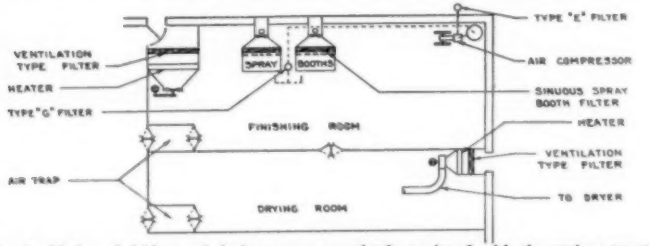
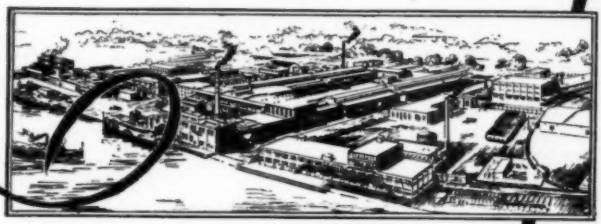


Fig. 1—Modern finishing and drying rooms completely equipped with the various types of air filters applicable to product finishing.

Economy



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capacity. This 15% overload was added to approximate the most adverse operating conditions.

The reduction in capacity was gradual and uniform until the filter had accumulated 5-lbs. of paint spray, at which point it began to fall off rapidly. The frequency of cleaning a spray booth filter, therefore may be determined by the time required for one filter cell to accumulate 5-lbs. of the material being sprayed—as shown more clearly in the curve on the chart marked Fig. 3.

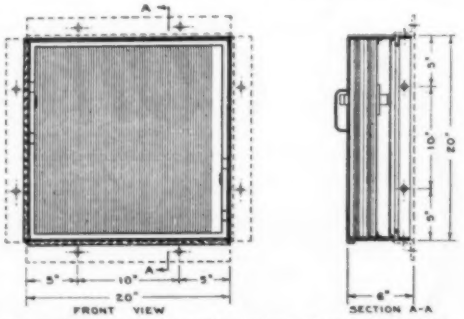

Fig. 2—Front and side sectional views of spray booth filter.

White test plates, which were placed immediately behind the filter and remained there throughout the test period, showed no evidence of paint spray deposits. The guaranteed efficiency of the Sinuous spray booth filter is 97%. The 3% that escapes is made up of tiny particles so small that they are practically of no consequence.

Cleaning Method; Reclamation

The proper method for cleaning this spray booth filter depends upon the type of material being sprayed.

Lacquer, because of its quick drying properties, is practically a dry dust by the time it reaches the filter. This makes it necessary to use a viscous coating on the filter with lacquer finishes. Viscosine B (filter oil) is recommended for this service. The filter is cleaned by immersing it in a tank of hot water to which cleaning compound or similar detergent has been added (1½-lbs. to 20 gallons of water). After the filter is washed clean it is dipped into viscosine, allowed to drain for 12 hours or more, and then put back into service.

Paints, varnishes, enamels and other slow drying finishes reach the filter as liquid spray. No viscous coating is required; the filter should be used dry. With these finishes the filter is cleaned by boiling in a caustic solution (10° to 15° Baume hydrometer) in what is commonly called a "stripping tank" usually found in plants where metal parts are finished.

While it is possible to reclaim paint spray from the filters by using the proper solvent, it will prove economical in very few cases. Where it is practical, however, reclamation presents another reason for the use of these paint spray filters, in addition to eliminating the nuisance and bother of surplus spray.

Clean Air for Finishing Room

If a number of booths are required to handle the volume of production, the large quantity of air exhausted from the finishing room creates a heating problem

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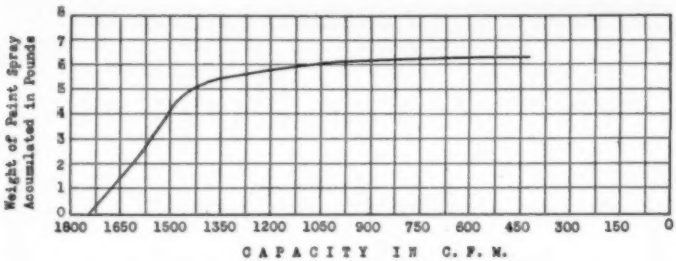


Fig. 3—Charted curve which shows results of air filter performance.

during the winter months and a dust problem throughout the year. While the air exhausted from a spray booth equipped with an efficient filter is clean enough to breathe, being freer from dust and dirt than ordinary outside air, the fumes that it carries eliminates any possibility of returning it into the workroom.

Until some practical method for removing fumes has been developed it will not be feasible to recirculate the air exhausted by spray booths. Additional heated air must, therefore, be introduced to make up for that which is continuously being exhausted from the finishing room.

A simple solution to both the heating and the dust problems is a fresh air supply system consisting of fan, heating coil and an air filter of the proper size and type. Some types of unit heaters are practical for this service if equipped with air filters, and if provision is made for them to take air from outside the finishing room. The ventilating system of the finishing room, shown in Fig. 1, is a typical arrangement. The inlet damper is adjustable, making it possible to take air from outside or some other part of the building in any proportion desired.

The capacity of the supply system should be equal to the combined capacities of the exhaust fans in the spray booths, plus ¼ the cubical volume of the finishing room. In this way a positive pressure will be maintained in the room and any leakage will be outward through cracks or openings. All the air inside the finishing room will be filtered, and when a door is opened clean air will flow out, preventing the entrance of dust and dirt.

EXAMPLE: A finishing room 30-ft. wide, 50-ft. long and 12-ft. high contains two spray booths, each exhausting 2400-cu. ft. of air per minute; what capacity ventilating system is required? Solution: ¼ of (30 x 50 x 12=18,000-cu. ft.) is 4500 plus 4800 or 9300-c.f.m.

Clean Air for Spray Guns

Another problem in spray finishing is the trouble caused by the presence of small particles of oil, water and dirt in the compressed air. A perfect finish can only be secured with clean, dry compressed air. Entrained oil and water are particularly bothersome when the compressor is located some distance from the spray booth, requiring a long run of pipe in which the water and oil vapor may condense.

A high-pressure air filter placed

Choose now

for better work at greater profit

Permanent Stain

Water Stain

The facts lead to but one choice — Murphy *Permanent* Stain

Saving real money is interesting to everybody, and saving money *plus* getting a better job is still more interesting.

Consider carefully these characteristics of Murphy Permanent Stain in connection with your own work:

No grain raising or subsequent sanding.
Clocklike regulation of filler application.
Immediate "automatic blending."
Instantaneous "high-lighting."
Rapid "matching-in" of variable wood.
Deep and rapid penetration without bleeding.
Absolute fastness to light.

And now consider this most impressive and convincing testimonial to the economy and efficiency of Murphy Permanent Stain.

One of the biggest cabinet users in the United States let out his enormous cabinet contracts in 1930 to concerns at strategic shipping locations in 13 states. His inspection and specifications are plain "tough" — and although his stain specification reads "optional — either Water or Permanent Stain" — every cabinet maker eventually chose Murphy Permanent Stain, and is now using it.

Such a unanimous practical production acceptance certainly invites *your* investigation. If you wish a demonstration or additional information write us.

Murphy Varnish Company
Newark Chicago San Francisco

ESSEX VARNISH COMPANY, Newark
(Associate Company)
Baking Material Specialists

Murphy Permanent Stain is licensed by the Chadeloid Chemical Company

in the air line, preferably nearest the point where the spray guns are operated, will eliminate entrained oil or moisture and any small particles of dirt or iron rust, thus insuring clean dry air.

Many high-pressure filters are now being used in this service. Reports from various users show that a filter of this type will remove from a pint to as much as a quart of oil and water each week, depending upon the operating conditions.

The efficiency of the air compressor will be materially increased by filtering the intake air before it enters the cylinder. Dust and grit cause 50% of the wear in a compressor and practically all of the maintenance. An air filter on the intake will reduce valve cleaning and regrinding, eliminate wear on cylinders and pistons, reduce the consumption of cylinder oil 25% to 50%, and add years to the life of the compressor.

Practically every manufacturer of air compressors recommends that an air filter be used on their equipment. Since compressor filters are furnished in many sizes and types for all kinds of compressors, it is necessary to know, the capacity (or bore, stroke and r.p.m.), and whether single or double-acting before one can make an accurate or suitable recommendation.

Ventilation of Drying Room

The drying of such finishes as paint, enamel, varnishes, etc., may be accelerated by properly ventilating the drying room. Bringing clean, fresh, warm air into contact with the finished surfaces and exhausting the fume laden air will materially lessen the drying time, and in turn reduce the cost of this operation.

When forced ventilation is used, however, it is necessary to clean the air to prevent dust and dirt from entering the drying room and settling on the finished surfaces.

While a drying room is not required for a lacquer finish, it is almost essential that the room in which this finish is applied be equipped with forced ventilation, as explained previously.

For small drying rooms, unit type viscous filters or "Airmat" dry filters are practical and economical. These filters require manual maintenance—washing and recharging the viscous units or changing the Airmat sheets in the dry filter—but since only a few units are needed the time and labor for this operation is a small item.

On larger systems or even on smaller systems where a constantly uniform air supply is essential, an automatic self-cleaning filter is advisable. The self-cleaning filter is more expensive than the unit of Airmat filters, but where the air requirements are large or exacting, the fact that they are fully automatic more than offsets the extra cost.

The paint and varnish of today is not the paint and varnish of yesterday, nor probably will the protective coating of tomorrow be that of today.

Meetings Scheduled Next Month

The Paint and Varnish Division of the American Chemical Society is planning three half-day sessions —Wednesday morning and afternoon April 1 and Thursday morning April 2—during the Society's Spring Meeting, March 30 to April 3, at Indianapolis, Ind. The Paint and Varnish Division has been assigned to the Severin Hotel. Robert J. Moore, Bakelite Corp., Bloomfield, N. J., secretary.

Get "Depth" of Finish in fewer coats with No. 6218 H B Clear Gloss Lacquer

Good body may be secured in fewer coats with No. 6218 Heavy Bodied Clear Gloss Lacquer. It is very durable, yet it rubs easily to a splendid lustre. More economical because it builds a heavier film and because it stands more reduction. No. 6218 is one of a series of fine clear lacquers developed to meet every requirement. Two other lacquers of unusual merit are No. 6222 Full Flat and No. 1616 Semi Flat. They are exceptionally clear and uniform. You can get the same satisfactory results with these lacquers that others are getting, and lower your finishing costs.

Improved Tumbling Lacquer

Produces a smooth finish of unsurpassed durability, on a wide variety of wood objects. Made in colors or clear. The most economical lacquer finish. Send sample of your product for complete tumbling recommendations.

JAMES B. DAY & CO.

CHICAGO

Lacquer, Stain, Enamel, Shellac
Finishes by Finishing Experts

Tumble Finishing — II

By
R. J. FAIRBURN*

Last installment of a 2-part article that explains the tumbling process of coating and polishing small parts, reveals what work is adaptable to this method of finishing, and supplies practical information about consistency of materials, correct temperature, tumbling time, troubles encountered, etc.

THE AMOUNT OF reduction for the tumble base (finishing material for first coat tumbling) will of course, vary with different materials; it will also vary for different conditions. Greater reduction is necessary for hardwood than for softwood; a thinner material has better penetration. This is also true if a very resinous wood is being finished.

On dark, streaky-grained woods, it is desirable to first coat the surface with a tumble base that has been greatly reduced. The operation may then be completed with material that has had less reduction. In this way, the thin material will provide a satisfactory bond for the heavier material which is necessary to give good coverage.

This procedure is also in order for objects that have holes or slots that are not to be filled with finishing material. The very thin material first applied will probably penetrate the hole. It will act about the same as a stain, and be absorbed by the wood. The heavier material to follow will not be apt to find its way into the holes.

Tumbling Operation

The tumbling barrel should be only about half filled with the parts to be finished. If it is half full, better results will be obtained than with either more or less work. This insures enough parts for plenty of friction, yet not too many to permit good tumbling action.

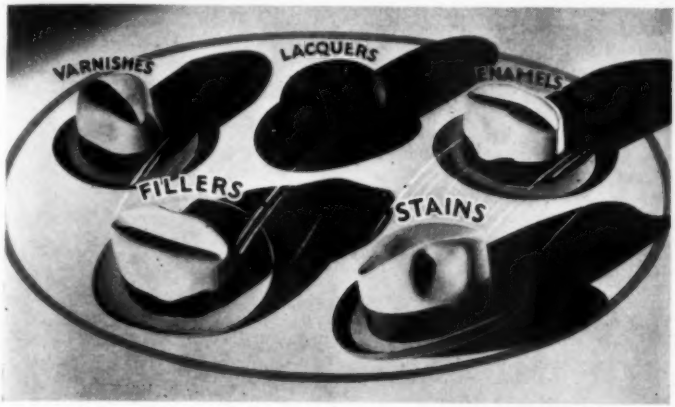
The object of using the screen door (coarse mesh wire) on a tumbling barrel is to permit screening out the dirt and sawdust that may cling to the articles when they are first put in the barrel. It is always advisable to screen out this dust and dirt by revolving the articles "dry" for a few minutes with the screen door in place—unless this detail has been previously attended to, perhaps with a regular screening drum.

After the screening operation, the screen door is replaced by the solid door, and part or all of the tumble base is poured in over the work. When it has been determined just how much base is required for a barrel full, the entire amount may be put in all at one time. Until that time, the base material should be added in small quantities until the desired coverage is obtained.

It must be borne in mind that sometimes more of one color is required than of another, for the same kind of work. For instance, bright red is a much stronger color than cream; therefore, less bright red is required than cream. This is also true of different

*With Brevolite Lacquer Co.

WITH THE RIGHT FINISH, YOU'LL FINISH RIGHT



Two New Hats in the Ring!

It is with real pleasure — and frankly with considerable anticipation of your interest, inquiries and orders — that we announce two new quality products for the industrial finishing trade —

LILLY STAINS AND FILLERS

With these two "new hats in the ring," we offer a complete service of Lilly quality in industrial finishes. Lilly Stains include water stains, oil colors, spirit colors, pigment or uniforming stains, non-grain-raising stains and shading stains — a wide range to meet every demand of color, texture, finish or drying requirements, for spraying, brushing or dipping. Lilly Fillers are of one grade only, best materials delivering maximum filling ability.

Lilly Stains and Fillers, like other Lilly products, are held to an absolute standard of uniformity in quality and absolute dependability in performance by a double-check supervision by both laboratory and manufacturing departments. Write us for full information about Lilly Stains and Fillers — as well as your requirements for varnishes, lacquers and enamels.

LILLY VARNISH COMPANY
666 South California Street
Indianapolis Indiana

LILLY

Kindly mention INDUSTRIAL FINISHING when writing advertisers

woods. More material is required to satisfactorily coat a dark, streaky wood than a white, even-grained wood.

After sufficient tumble base has been applied and the barrel has run until the work carries a uniform coating, the barrel should be run with the screen door again in place, until the coated surfaces appear to be dry and powdery. Then the tumble polish should be poured over the work. A higher polish will be obtained if this polish is added a spoonful at a time. When sufficient polish has been applied, the barrel should be revolved until the finished surfaces are highly polished.

Tumbling Time

Prolonged tumbling may dull the finished surfaces. It is better to stop the barrel at just the right time. Do not permit the barrel to revolve too long between applications of polish; to do so may permit the polish previously applied to harden and then be softened and marred by what is subsequently applied.

The time for each operation will vary with different conditions. When tumble lacquers are used, the average time is two hours for a complete operation—that is, base, polish and complete drying.

What Causes "Sticking"

Perhaps the trouble most often encountered with tumbling is "sticking." This usually occurs during the polishing operation, but sometimes it occurs while the base coat is being applied; adding too much polish at one time may cause it. The remedy, obviously, is to add polish in smaller quantities. Some articles having broad, flat surfaces, may stick together in spite of ordinary precautions. In some cases the work is not adapted to tumbling; in others, it may be broken apart by placing blocks of wood 2x4x6-in. in the barrel and revolving it until the parts stuck together have broken apart.

Lumpy, Mottled Surface

This may be due to too much base having been added, or perhaps because too much polish is being used, or possibly too great an interval is allowed between applications of polish. Usually the finished articles may be salvaged by putting a few rags in the barrel, and revolving the barrel until the finished surfaces have been smoothed. Then it is sometimes necessary to repolish the work.

Clean Surfaces Essential

Occasionally a lot of turnings will mildew or become soiled before they reach the finishing room. Sometimes they can be cleaned by revolving the barrel with rags put in with the articles being tumbled. In other cases the surfaces may be so dark and spotted that it is necessary to resort to two operations. In this case tumble base can be applied in the regular way. A very small amount of polish is added; then the work is permitted to stand several hours after which the entire operation is performed over again.

Combination Operations

Tumbling is sometimes combined with dipping, spraying or brushing. Articles are sometimes dipped in stain and then finished by tumbling. Usually enough tumble base is applied to provide a foundation for the tumble polish.

In other cases the base coat is tumbled on, and the work then finished by spraying, dipping or brushing. This is usually done if

"Why in thunder should a SALESMAN show pretty pictures?"

EFFEMINATE as it seemed to Josiah B. Eaglebeak—his competitor's salesmen had portfolios of advertising—and were landing unheard of orders. The nances!

Those "pretty pictures" were convincing hard-boiled buyers that these men had more than a good product—they had a product that would *sell*. Today Josiah has discovered that his customers keep an eye on turnover—and he, too, strives to convince them that he's built a market for them.

It's hard, sometimes, to see that a good *lacquer finish* will build newer, bigger markets for your product. Salesmen *can* be taught to sell beauty. It pays. It motivates too many consumer dollars to be sneered at. When you start selling the appeal of the Egyptian lacquer finish on your product, you've started something.

Egyptian welcomes the manufacturer who's "tried lacquer" and found it a flop. Egyptian makes *good* lacquer. We show you how to use it. We sell you only what we know will truly succeed on *your* product. Won't you look up the Egyptian man? He's conveniently near.

THE EGYPTIAN LACQUER MFG. CO.
90 WEST STREET, NEW YORK CITY

Branches in charge of practical men *maintained in:*

Atlanta	Cincinnati	Kansas City	San Francisco
Boston	Cleveland	Los Angeles	Seattle
Buffalo	Dallas	Philadelphia	Spokane
Chicago	Detroit	Portland, Ore.	St. Louis

***The Maker Who is PROUD of What He Makes,* Uses EGYPTIAN LACQUER**

the object is to have a trade mark or some decoration put on over the base coat. The finish coat is clear lacquer or varnish.

New Denatured Alcohol

The old industrial alcohol formula No. 5 may be purchased from certain sources until about June or July, this being from stock made up. After that supply is exhausted every finisher will have to use the new formula. No doubt there are those who do not know about this change and will be at sea when they discover it, not knowing whether the new formula is safe for finishing purposes. I have tested the new formula and find it is O.K., but the attached clipping from *Patton's Monthly*, containing a report of Mr. Henry A. Gardner, will be of much interest to all those engaged in wood finishing.—F. W. Purdon.

EDITOR'S NOTE: The Pittsburgh Plate Glass Co.'s magazine article reads as follows:

Effective January 1, 1931, the Treasury Department ruled that the use of Methanol, the extremely poisonous denaturant which has been used in denatured alcohol, be discontinued. Samples of the new formula alcohol are now available, and it is beginning to find its way into stocks.

The old formula No. 5 consisted of 100 parts of ethyl alcohol to which were added 4 parts of methanol, 0.75 part of aldehol and 0.5 part of benzine, in some cases high test aviation gas.

The new formula No. 5 contains only one part of aldehol and 1¼ parts of "*alcotate*," the name given to the new liquid which has facetiously been said to smell like rotten eggs and garlic. Both aldehol and alcotate are petroleum derivatives. The new formula as a result of these denaturants has a very strong petroleum odor.

As a large use of denatured alcohol is as a medium for cutting shellac, users will be worried as to whether the new formula No. 5 will be satisfactory for this purpose. Several shellac cutters have used it and report that it is all right, and the odor has been overcome by adding a small quantity of ethyl acetate.

The American Paint & Varnish Manufacturers Association has also conducted experiments in its Washington Laboratory and has reported, "It has been found that the odor is not permanently objectionable, and might be disguised." Below are the results of the work so far as described by Henry A. Gardner, director of the laboratory as follows:

"Experiments just made at Gregg Memorial Laboratory with shellac cut with formula No. 1, also with No. 5, the latter containing aldehol and alcotate petroleum derivatives denaturants which have been described as having garlic odor. This type alcohol non-toxic and apparently no harmful physiological effects. Tests made in two large laboratories having floor area of over 400 feet. Floors scraped and given two coats of respective finishing. Working properties, drying time, sanding value, and other physical properties about identical.

"Odor of new No. 5 very pronounced in container, which might at first possibly create sales resistance to shellac, but might be overcome through use of small amount of ethyl or butyl ester or trace synthetic perfume. After working with No. 5 shellac, during which time about three quarts of the alcohol vaporized, painters'

(Continued on page 58)

Principal:
chief; highest in rank, authority, value or importance; most considerable; main; first.

— that's what the DICTIONARY says

LINGERWETT
is the *Principal* remover

More Lingerwett is sold than any other remover

In almost every line of business there is one *principal* product that stands out from all others—in performance and in sales. Among removers, that product is *Lingerwett.*

Lingerwett is a *different* remover—different in formula, different in manufacture, and, what is most important to you, different in its action and its results.

No removing job is too tough for Lingerwett whether there are five coats, ten coats, fifteen coats or more. Lingerwett goes right through them all in the shortest possible time.

And here's another big time saver with Lingerwett—the troublesome sticky mess you get with most removers causes lots of extra handling and delay, but with Lingerwett you get loose sludge that is easily wiped up.

Lingerwett will save you time, labor and money on any work you put up to it. Give it a chance to prove itself on your very next job. Order Lingerwett NOW from your regular source of supply. Or send the coupon for free trial can.

FREE TRIAL OFFER

Fill out, cut out and mail this coupon and we will send you a free trial can of Lingerwett.

The Wilson-Imperial Company
Newark, N. J.

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Please send me a free trial can of Lingerwett.
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LINGERWETT

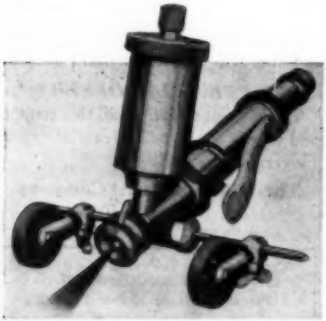
New Materials and Equipment

Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

Mechanical Striper

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill., calls attention to the Type UATS airbrush striper with gravity cup, guide wheels and hose coupling. According to the announcement: "The UATS airbrush striper will furnish a wide variety of blended and striping effects. The wheel guides are adjustable, spacing the airbrush head at proper distance from work to obtain width of spray wanted. The distance between the wheels is also adjustable to accommodate tool to contour of any surface to be finished or decorated.

"Standard multiple spray heads in many sizes can be coupled to airbrush for use with light or heavy colors, providing a variety of results. Operates on low or high air pressure; produces from fine to wide, smooth spray, stipple or blended effects. Net weight 10-oz.; size 6-in. long, 4-in. high."



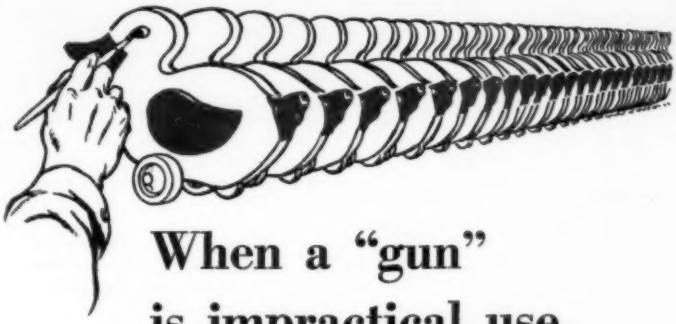
Offers new and striking decorative combinations in colors or plain black and white work. Used for striping, aircoloring, stenciling, painting, lacquering, shading and stippling.

Measures Viscosity Accurately

An instantaneous electric viscometer for rapid measurement of the viscosity of finishing materials has been developed by the De-Vilbiss Co., Toledo, Ohio. This device indicates viscosity of paints, varnishes, lacquers, oils, etc. in visual scale units, just as the ammeter on the dash of an automobile indicates the rate at which the battery is being charged.

The electric viscometer measures viscosity by rotating an impeller immersed in the liquid under standard electrical conditions. It shows liquid consistency as a dial reading. The effect of the viscosity load imposed by the liquid upon the impeller is determined by the effect upon the electrical circuit of the rotor driving the impeller.

When measuring the viscosity of any liquid with this electric viscometer, it is not necessary to change the liquid from one container to another. All measurements can easily be made in the original container. The liquid does not need to be transferred



When a "gun" is impractical use

S-W Industrial Brushing Lacquer

Drawing in the eyes on a toy duck . . . striping or lettering . . . coloring up the vestibule floor of a railway passenger coach . . . there are hundreds of uses where you need the quick drying characteristics of lacquer but where a spray gun is impractical.

Then is the time to think of Sherwin-Williams Industrial Brushing Lacquer!

For a quick job where the surface must go back into service quickly —for fine markings and lines where you need quick drying and "one coat" covering you will find this brushing lacquer ideal for any surface on any material.

S-W Brushing Lacquer for industrial use sets dust-proof in a few minutes . . . is ready for handling in an hour . . . has a natural high gloss . . . doesn't pick up the undercoat or print. Most colors are opaque with a single coat. A wide range of colors available.

Look over your present paint and lacquer uses for one or more places where this brushing lacquer might save time and money, then write us for complete information. The Sherwin-Williams Co., Dept. 708, Cleveland, Ohio.

SHERWIN-WILLIAMS

Industrial Brushing Lacquers

Reads directly in viscosity units; is instantaneous

into the instrument. Instead, the instrument is introduced into the liquid in its original receptacle.

In operation, an attachment plug is connected to any light socket and the instrument connected with the line by means of a snap switch. The potential on the circuit is adjusted to a definite value by means of a control dial and the impeller is then submerged in the liquid. The push button on the handle of the impeller mechanism is depressed and the consistency of the liquid is simply read from the viscometer dial.

Glyco's "No Foam"

The problem of excessive frothing and foam, as well as too great spreading and penetration, for many liquids has been a source of great annoyance. Many ingenious mechanical methods are often used to overcome this—but often they are inapplicable. Technically all of the above mentioned phenomena are brought about by a decrease in surface tension. To counteract this many surface-tension increasing liquids such as alcohol, cresol and glycerine have been used.

Recently there has been put on the market by the Glyco Products Co. Inc., Bush Terminal Bldg. No. 5, Brooklyn, N. Y., a product known as "No Foam." This increases surface tension greatly and thus tends to minimize frothing and foaming, spreading and penetration. It is especially applicable in textile printing pastes and printing inks where excessive penetration and spreading are undesirable. Its attendant lubricating value in these products containing lakes and other insoluble dyes and pigments, makes it of great interest.

"No Foam" is a water-white liquid having a characteristic fatty odor. It is insoluble in water but soluble in most organic solvents. It boils between 320° and 392° F. It is an excellent solvent for oils, greases, resins, etc. In the small quantities used in inks it gives them a pleasant odor, masking the unpleasant tones.

Where excessive lather in soap or other cleaning solutions is undesirable, it may be used to good advantage. In boiling solutions of chemicals, varnishes, etc., it is likewise used to prevent foaming and "creeping." In lubricants where excessive penetration is undesirable "No Foam" cuts down this tendency. In hair and fur dye solutions and bleaches, it localizes the action and gives sharp contrasts and enhances the luster.

ZELLAC

Price-per-gallon versus Value-per-gallon

It is not what you pay, but what you get for your money, that counts. Your customers and their customers, in today's search for value, apply their critical judgment to your product *by inspecting the finish first.* After all, a superior finish attracts buying attention and either makes the sale or gets it well started, regardless of other merits offered by your product.

Present day conditions make it absolutely necessary *to buy greater value in the lacquer finishing materials used.* No longer can you buy lacquer on a wasteful price-per-gallon basis. Low prices do not usually mean true economy. *Value,* rather than price, is the important consideration today. This is the Zeller policy—the reason why Zellac grades represent the utmost in quality and economy.

ZELLER LACQUER MFG. CO., INC.

20 East 49th Street, New York City

CHICAGO WICHITA
LOS ANGELES SAN FRANCISCO
PORTLAND DENVER SEATTLE

ZELLER

Air Separator

The Motor Improvements, Inc., 365 Frelinghuysen Ave., Newark, N. J., announces an improved "Purolator" air separator or filter which is designed to filter all oil and water from air in compressed air lines.

According to the company's literature: "The Purolator air separator is made of an enclosing case in which is a separating element constructed of a bronze ribbon formed into a cylinder. On one of the flat surfaces of this ribbon projections are formed at regular intervals to hold the successive layers apart so as to form filtering spaces or slots .0015-in. in width. These projections and also the outside surface of the filter cylinder act as baffles to the incoming air, separating from it the greater part of the oil and water. Further separation is effected by the shearing action of the edges of the filtering slots.

Traps oil, water and sediment in compressed air line

"The oil and water thus removed from the air, trickle down the outside surface of the element and drop to the bottom of the containing case. Some of the oil and water sheared from the air at the edges of the slot adheres to the ribbon until drops are formed which gradually are carried to the inside surface where they accumulate into drops large enough to roll down the inside surface of the element into the condensate trap. From here they drain automatically into the bottom of the enclosing case.

"Theoretically, there must be some trace of moisture left in the air passing through the Purolator air separator, but with the rapid vaporization of these fine globules accompanying the sudden reduction in pressure from the line pressure to the normal atmospheric pressure, the air delivered from the nozzle is to all practical purposes, clean and dry."

Pneumatic Sander; Polisher

Freeland Sons Co., Sturgis, Mich., announces the Freeland pneumatic horizontal sander which "makes sanding, polishing and waxing a pleasure." This 3-lb. portable machine can be used for dry or wet sanding to (1) remove old finish (2) clean any surfaces for application of first coats (3) smooth coated surfaces for succeeding coats of finish; or to polish final coats or apply and smooth wax on finished surfaces.

Operated by compressed air . . . . no attention required except occasional oiling.

WHY STOP AT THE FINISH?

THOSE NEW PRODUCTS OF YOURS . . . utterly different in design - - in construction - - in utility. What are you going to do about their finish?

Surely, you don't intend to handicap them with an antiquated finish - - a finish that is used by every Tom, Dick, and Harry in the business. Not when you can have our studio create, without cost or obligation, a brand new finish - - one that is strictly in keeping with the freshness of the products themselves.

We thought not - - that's why we remind you of our standing invitation to send in a sample piece for our experts to finish in accordance with your ideas or theirs. Remember - - no cost, no obligation.

The

ROCKFORD VARNISH

Company

ROCKFORD, ILL.

According to the manufacturer, "the air valve, which is the heart of the instrument is revolutionary in air tools and air devices, allowing the use of very small and mighty tools that can be held in one hand. Heavy pressure can be used without jumping, gouging or chattering. No hand vibration. Automatically adjusted to any speed with control lever on handle grip."

The shoe carrying the sandpaper pad travels back and forth 1-in. at 4,000 times per minute. The machine operates from 75 to 90-lbs. pressure and uses about 6-ft. of air per minute.

Oil-Fired Oven Heater

The Paul Maehler Co., 2207 W. Lake St., Chicago, is now manufacturing an oil fired oven heater known as the Oil-fired Maehler-Universal Heater. It operates along the same general lines as the gas-fired model. The heated air from the heating chamber is forced by the blower at the outlet end of the heater into the oven, creating a slight plus-pressure, which distributes the heat evenly throughout the oven, providing uniform temperature at all points.

Recirculating air, drawn from the oven at a high temperature, is reheated and tempered with a controlled volume of fresh outside air. Thus the heated air in the oven is not wasted but used over again and the heater is required to raise the temperature only slightly. In this manner also, explosive vapors are drawn from the oven and incinerated in the heater instead of being allowed to collect in the oven.

The burner and blower equipment are very simple in construction and are said to require a minimum of attention. The remote control cabinet is equipped with a Bristol temperature controller which regulates the oil flow to provide uniform oven temperature at all times, and may be set for any desired temperature over a wide range.

The heated air is delivered at the top of the oven and withdrawn from the bottom, eliminating dust and dirt catching pipes or radiators inside the oven, and making the entire oven area available for productive work.

This oil-fired heater is available at present in five sizes with an air delivery capacity of 3,000 to 12,000-cu.ft. per min. and a B.T.U. delivery of 450,000, to 3,000,000.

SAN-ITAI-RIE FILLER

Pat. No. 1658605

For All Defects in Wood

Manufacturers in all wood-using industries find SAN-ITAI-RIE FILLER unsurpassed in filling cracks, worm holes, knot holes, open joints, dents, pitch pockets, etc., and through its use are able to send out their products without a flaw.

Put up in friction top cans—half pints to gallons—in 20 different colors. Send for sample can.

SAN-ITAI-RIE FILLER CO.

Division of

164-170 W. Kinzie St. G. J. Liebich Co. Chicago, Ill.

Metal Finishing Department

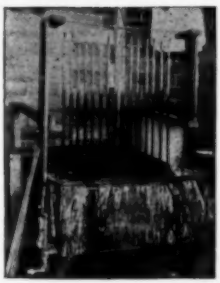
Cleaning-Handling Baking & Polishing

Finishing Rear Vision Automobile Mirrors

Production manager of A. G. Snider Industries, Inc., Indianapolis, Ind., formerly Hilab Products Co., describes the process used to clean and finish mirrors and fittings for passenger automobiles and trucks

By L. G. WINKLER

THERE ARE perhaps more problems entering into the manufacture of rear vision mirrors for motor cars than any other kind of mirror. Sizes have not been standardized, except for the fact that truck mirrors are generally round and passenger car mirrors are rectangular; there are no standard designs. Some mirrors have clock inserts, others do not; face bevels vary both as to degree and type. Finally the question of suitable protection from the elements, especially in truck mirrors, thrusts upon us a finishing problem that does not exist in the manufacture of any other mirror. This problem must be adequately solved if a satisfactory and durable rear vision mirror is to be produced.



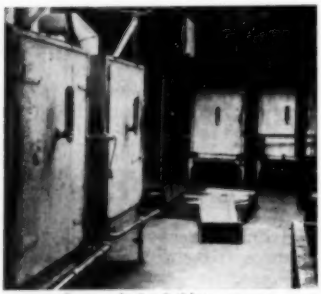
In order to illustrate the extreme care which must be exercised to protect these mirrors from the elements I shall be compelled to cover some work not usually classed as finishing operations.

To obtain satisfactory production, all mirrors—regardless of whether they are to be used for passenger cars or trucks—

follow the same course of procedure up to a given point in our schedule. Glass is cut into blanks of sufficient size to make six mirrors. These blanks are blocked or polished on both sides on power-driven machines. A careful inspection follows because the slightest flaw or scratch in the glass will be more prominent after the application of silver, which is the next operation.

When the silver is thoroughly dry, a coat of special shellac is applied—followed by a spray coat of black mirror-back paint which has a spirit base. These mirror blanks are allowed to air dry; then each blank is cut into six individual mirrors, either rectangular or round. Next the back edges of the mirrors are chamferred, and a heavy craft paper is glued on the face to protect the polished glass surface during the ensuing operations. Mirrors are then placed face down in trays and the edges and back are given a spray coat of the same mirror-back paint just mentioned.

After air drying 12 hours, the corner radii are ground on rectangular mirrors, then these as well as the round mirrors receive another spray coat of mirror-back paint. Thus the back surfaces of all mirrors receive three coats and the edges receive two coats of mirror-back paint. When dry, a spray coat of crystal finish (having a china-wood oil base) is applied to the edges and backs of the mirrors, which are then placed in a fouled oven for 30 minutes at 125°F. This produces an attractive as well as a hard, tough, crystal coating which adequately protects the silver from the elements and abrasion.



Some of the baking ovens

This final coat is allowed to air dry overnight; then those mirrors requiring it are face beveled and the bevels polished. All of the mirrors are dipped into warm water to remove the craft paper on their face sides; then they are thoroughly dried and assembled.

All mirror hardware, consisting of brackets, rod supports, frames, etc., is washed in oleum spirits to remove the surface grease; then rinsed in boiling water to remove the degreaser, and dried. This completes the metal-cleaning operations for ordinary commercial work. Stampings to be used for high grade work are brushed or wiped before finishing.

We use three methods of applying japan—spraying, dipping and tumbling—depending upon the shape and size of the parts and the class of finish required. For example, on high grade round mirror frames, the japan is applied by spraying. Rod supports are generally dipped (see illustration at beginning of this article); for certain small parts and brackets, I am convinced that the best results are obtained by tumbling. I can add very little that is not already well known regarding the first two finishing methods, but I believe the rigid and careful application of our system of tumbling is responsible for the absence of fat edges, runs

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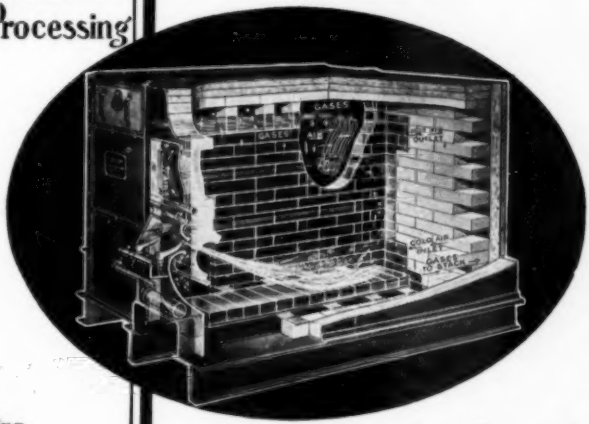

Baking Japans

Baking Enamels

Drying Paint On Automobiles and Metal Furniture

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There is really nothing to rapidly deteriorate in this remarkable new heater. The tubes cannot distort or burn out for they are not touched by the direct flame. No special tiles or tube protection is necessary.

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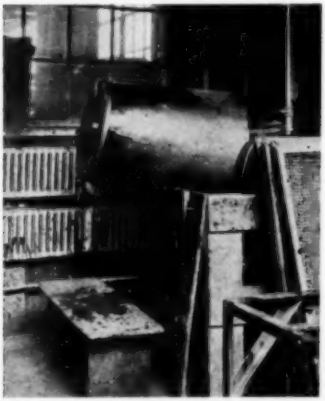
or tear drops, and excess material.

Stampings adapted to tumble finishing are first separated into groups according to shape, size



The tumbling barrel in which parts are tumble finished. Notice, at extreme right, the wire mesh racks on which small parts are placed after being tumbled; loaded racks are then placed in oven.

and weight. For each group we have found out, by experiment, the exact number of fluid ounces of japan which will satisfactorily coat a given quantity of stampings by weight. All of this data is retained in a book and the schedule is rigidly followed at all times in actual practice. It is never a question of what the foreman or operator thinks regarding the correct amount of finishing material to properly coat a batch of stampings.

Each part is classified; stampings are accurately weighed and placed in the tumbling barrel; then the correct amount of japan is added and they are tumbled for a given length of time. It is impossible to enumerate and describe the various stampings and the quantities of material necessary to produce a satisfactory finish, but an average of 8 to 10 fluid ounces is required to 20-lbs. of stampings, and the average tumbling time is 20 minutes.

After the application of japan the parts are baked for 60 minutes at 325°F., and they are ready for assembly.

Removing Finish from Aluminum

Before removing the old finish from any metal product, a small area of the metal surface should be exposed and tested to determine whether or not it is aluminum. If it is steel, iron, brass, etc., it may be safely immersed in the boiling lye tank. On the other hand, if aluminum is placed in boiling lye, it will be found upon removal that the surface is badly eaten and rough. Of course, the action of the alkali may be stopped by a neutralizing solution of acetic acid; however this will not bring back the original smooth surface. In the majority of cases the product is ruined, so far as a good refinishing job is concerned. —P. C. Bardin.

Industrial Oven Catalog

The Foundry Equipment Co., 1831 Columbus Rd., N. W., Cleveland, Ohio, has just issued its new Catalog No. 31 describing Swartwout industrial ovens for japan, enamel, paint and lacquer drying, armature and insulating varnish baking, ceramic drying, low-temperature heat treating, and other manufacturing processes requiring temperatures up to 900° F. This catalog is 8½x11-in. in size, contains 48 pages, and a complete description of the Swartwout oven design and valuable information on the use of various types of fuels and heating equipment, together with many illustrations and diagramatic layouts of representative installations.

AT LAST! Presto No. 96 IT IS HERE!

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Now you can have a famous Presto high quality, force feed, low pressure, internal atomization spray gun — with two finger trigger and stainless steel needle valve for accurately controlling the flow of material — at the remarkably low prices quoted below.

This new Presto No. 96 is distinctly precision built, thoroughly dependable, compact and light in weight. It applies either light or heavy consistency materials at high speed in a perfectly controlled, finely atomized, wide fan or small round spray. Advanced design reduces rebound, fog and mist to a minimum. For use on small compressors or from air lines with pressure reduced to 35 or 40 lbs.

1 Presto Model 96-OC-A Outfit for use on compressed air lines. Outfit consists of: No. 96-B Gun, air conditioning unit, pressure regulator, gauge and 25 feet of ¼" air hose — $36.75.

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The gun and outfit shown on this page are only two items from the complete line of Presto Spray Guns and Finishing Equipment pictured and described in Presto Catalog Number 32. Mail the coupon for your copy today.

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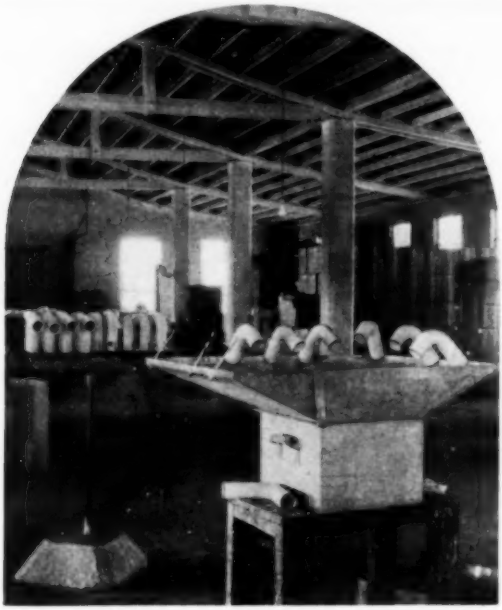

Porcelain Enamel Finishing Pipe Ells

By
C. A. WULF

President and general manager of the American Valve & Enameling Corp., Indianapolis, Ind., tells how, through a process of evolution, the porcelain toilet ell (L) was developed, how it is finished, and describes some of the new uses for vitreous finishes

THE STORY is simple. The development of the porcelain ell (L) was anything but simple. We started out to manufacture valves, and the porcelain enameled tanks were merely a necessary adjunct to the valve business. Finally the child outgrew the parent and eventually, instead of making valves, we found we were operating an enameling shop.

Then came the popularity of bathroom fixtures in color and a demand for something better than

Lac says:—"He's doing a 'tricky' bit of painting—but you can't fool the modern motorist with a poor, short-life lacquer finish."

Appearances *are* deceiving — but a fine, durable lacquer job does make a *great* difference in determining the popularity of a car. Many automobile manufacturers are beginning to realize that the public demands a lacquer finish that will "stand-up" under practically all climatic and operating conditions.

These progressive manufacturers are increasingly demanding lacquers and thinners that are properly formulated with

PENTASOL AND PENT-ACETATE

to assure the best lacquer finish it is possible to obtain.

As Lac says:—"Finishes *do* make a difference."

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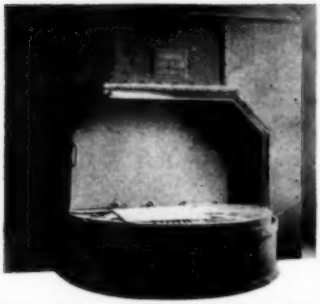


View of rotary sandblast which is used for cleaning castings.

the nickel-plated ell connecting the water tank and the toilet. Our answer was the porcelain ell. Brass tubing was out of the question, as vitreous enamel does not adhere to commercial brass satisfactorily. Then we tried to bend steel tubing. It was unsuccessful; the bend was too short and the metal was too thin.

Now we produce these ells from 20-gauge sheet steel (pure iron), cut and stamped out to shape in halves. The two halves are then electrically welded on a special machine which produces such a smooth joint that subsequent grinding is unnecessary. I have given you this bit of history that you may know something about the background of the porcelain ell and understand what kind of a surface we have to work on.

While porcelain ells are made in all standard sizes, it is impossible, as in the case of the nickel-plated ell, to predetermine the exact length required for each individual installation. Therefore the vitreous finish must be such as will permit the plumber to saw the ell (with a fine-tooth hack saw) to the required length without shattering the finish. This has been accomplished through correct formula, accurate mixing, extreme care and uniform and unwavering methods of finish procedure.

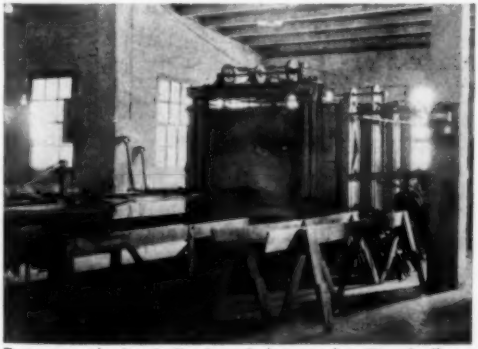
We give the metal cleaning job special attention; in fact our handling costs in the pickling room are probably higher than those of some of the other small vitreous-ware finish shops where the pieces to be cleaned are piled in monel metal baskets. Each ell is placed on an individual pin on a metal rack, the loaded racks being lowered from an overhead monorail conveyor into the various cleaning solutions. By this method the metal surface of one ell does not contact that of another ell during the cleaning and,

Fig. 2—Drying oven, the doors of which have rack supports on each side.

being held rigidly in a semi-vertical position, the inside surface of the ell is cleaned as thoroughly as the outside surface.

Cleaning procedure follows in this order: (1) chemical wash, (2) hot water rinse, (3) muriatic acid, (4) cold water rinse, (5) hot alkali neutralizer, (6) hot borax wash, (7) dry. The borax wash, after the ells are dried, produces a thin white film of borax on the metal surface which has no detrimental effect on the subsequent finish coats; really this thin white film prevents any rusting of the surface due to atmospheric conditions between cleaning and finishing.

Ells are coated inside and outside by being dipped in the ground coat (see picture at beginning of article) after which they are placed on pins to drain and then carefully transferred to the drying rack (shown at the left in that same view). These racks, each containing 18 ells, are placed in the drying oven, as shown in Fig. 2, for 20 minutes at 120° F. Close inspection of Fig. 2 shows that the six doors of this drying oven are equipped with rack supports



Box type of electrically heated furnace for "burning" on vitreous enamel finish.

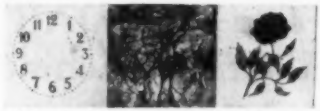


Fig. 3—Other examples of vitreous enamel finishing.

on both sides of the door and that the doors are pivoted in the center so that they can be revolved. By this means, the loading, operating and unloading of the drying oven becomes a continuous operation, the operator loading the outside of the oven door, then revolving the door half way and removing the rack containing the dried ells from the inside of the door. Approximately 20 minutes is required to completely load the oven.

The ground coat is burned for 2½ minutes at 1700° F. Ells are then returned for the first and second color coats which are successively dried and burned—the first color coat for 3 minutes at 1650°F., and the second coat for 3 minutes at 1600°F.

Ells are then inspected, gauged for correct diameter and packed in individual cartons which are boxed for shipment.

On stove work and other custom jobs, we pickle the steel parts and sandblast castings, using a mixture of sand and steel grit at about 70-lbs. air pressure in a rotary blast. In this department we spray all coats including the ground coat; each coat is oven dried for 20 minutes at 120°F. These three coats are burned succes-

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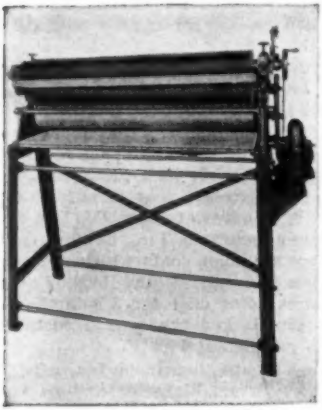

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sively at 1500°, 1450°, and 1400°F. —from 2¾ minutes on steel parts to as high as six minutes on castings, depending on the weight of castings. On some parts (according to specifications) after the first or second color coats are burned, a wood grain effect is transferred to the surface by the rubber roll method; this graining coat is then burned for 2¾ minutes at 1400°F.

Some of the other products on which vitreous enamel finishes are becoming popular are electric clock dials, signs, imitation marble panels and mouldings; also backgrounds for Neon signs. Samples of three of these products are exhibited in Fig. 3—the clock dial, imitation marble panel in green and white, and a red rose with green foliage on a white background, used in connection with a Neon sign. There is an unlimited field for the application of vitreous enamel and new uses are constantly being found for this beautiful finish.

Accurate distribution cost data give the manufacturer a sound basis for policy decisions on what part of the distribution he will attempt and what part he will leave to wholesalers, retailers, or other selling agencies.

Worthington Sales Executives Hold Annual Meeting

Sales executives of Worthington Pump and Machinery Corp. (2 Park Ave., New York City) from all over the U. S. assembled for the annual meeting in Harrison, N. J., February 9. At this meeting, Mr. H. C. Beaver, formerly executive vice-president of Rolls-Royce of America, was introduced as a new vice-president. He will devote his efforts principally to the administration of the Sales Department. Mr. E. E. Yake, as formerly, was advanced to the office of vice-president to direct manufacturing and engineering.

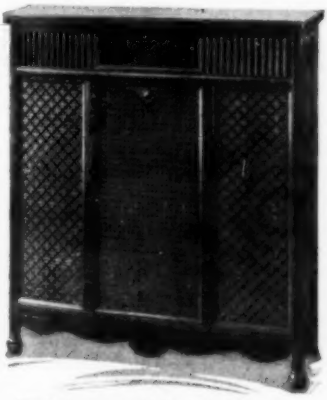
Finishes for Radiator Covers

By
ROBT. G. MUDGE

Experienced finisher tells about the protective value of metal radiator covers and explains several difficulties encountered in finishing them to meet the present demand for appropriate decorative effects and to withstand the heat and moisture to which the finish is subjected

RADIATOR COVERS are constructed to distribute heat evenly, cover unsightly cast iron radiators, and become pieces of fine furniture. A tall radiator is transformed into a console; a vase and mirror completes the setting. A low long radiator becomes a window seat, adding charm and comfort to the room. A like transformation takes place in the appearance of an elegant office.

Aside from the above mentioned features, the radiator covers eliminate dirt, making heat-smudged walls a thing of the past, and they protect drapes and other decorations. Here again finish comes to the front as the outstanding feature for style and color to match the surrounding decorations and finish as to durability to withstand heat and steam.



Typical custom built radiator cover.

Custom Built

Our radiator covers are built to the individual specifications, as to size, style, color, and finish. A water pan directly over the radiator, yet concealed from view, keeps the room tempered with warm moist heat. This water pan, while serving its purpose well, adds to the problems in the finishing department.

The finish must stand whatever heat is required in various rooms, with the added moisture thrown from these pans and perhaps, as is often the case, a few hours later the radiator is turned off and allowed to cool. With this procedure going on at intervals through the winter months, much thought must be given to the durability and resistance of the finishing materials used. In this instance some of the new and modern primers (air drying) cannot be used, but the old, long-in-oil baking primers replace them. An extra good base is essential.

The best in finishing materials must be used throughout to prevent cracking, checking, etc., under the strain of varying heat and moisture at many different degrees, in a short period of time. Finishing radiator covers also

After almost two years in the darkest corner of a purchasing agent's desk . . . our star salesman popped out and made the sale!

For a long time one of our representatives had been calling at a plant. . . . but you know how folks dislike to make lacquer changes! On one of his visits he persuaded the P. A. to pigeon-hole a piece of brass which had been lacquered and subsequently blanked and formed. *(See photograph)*

Almost two years after our man left the sample *(demonstrating flexibility and permanent adhesion,)* THE PHONE CALL CAME!

About 1000 vacuum bottles had been returned from an export shipment because the lacquer enamel was chipping badly, in some places peeling clean from the metal. The P.A., who was drawn into the rumpus, happened to remember the little metal strip which had been in his desk for almost two years. He took it out, twisted it, bent, abused, fingernailed it. STILL FLEXIBLE . . . . . PERMANENTLY ADHERENT!

All this happened two years ago. The original test bottle finished from material in our first shipment to them is still available as exhibit-A. The superintendent is fond of banging the bottle with a hammer every now and then just to reassure himself that his finishes are *permanently* FLEXIBLE AND ADHERENT. And they are! *(name of manufacturer on request.)*

We have informative Research Bulletins on lacquer-finishing any of the materials listed. Check the subjects in which you are interested. Attach the list to your letterhead.

ROXALIN

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☐ WOOD ☐ RUBBER ☐ ALUMINUM
☐ BRASS ☐ ZINC ☐ DIE-CAST METAL
☐ CLOTH ☐ GLASS ☐ CADMIUM PLATE
☐ STEEL and Other Ferrous Metals

leads to every known kind of finish, some jobs calling for a finish to match the wallpaper, drapes, woodwork, rugs . . . and many color schemes. For example, I noticed recently, while working on a dozen different jobs, the specifications called for five of these to be in lacquer finish, two in two-tone stippled effect, two in two-tone shaded effect and one in the new crackle finish; no two were the same in color.

Of the seven remaining jobs, four called for different kinds of graining—one a standard grain, and three to match different wood samples; one specified the new wrinkle or shrivel finish, one a marble, and the last a solid green with black and gold shading. Enough to make any finisher lose patience but merely in line with the modern-day color trend. Thus many different kinds of materials must be used, making every job a special one.

For the fronts of radiator covers, a metal imitation of cane is generally used, although perforated metal, woven wire, and embossed metal are sometimes installed. The better imitation cane and woven wire being imported from foreign countries, adds to the finisher's problems, as this is packed in oil-soaked sawdust as a rust preventative, making the cleaning problem a difficult one.

In conclusion, radiator covers—the new and modern piece of furniture—are very desirable for a clean, fresh appearance; they aid the decorator in his quest for harmony, satisfying the public in smart decorative designs in any home, commercial building, or institution where radiators are in use.

A problem defined is two-thirds solved.

Lacquer for Hats

The use of nitrocellulose lacquers in the hat industry reveals one of the later converts into the field—lacquer, a product with a 1,000,001 uses. In the past the manufacturers of braid, straw, and fiber hats employed glue sizing to stiffen the hat braid. The uncontrollable workings with this type of sizing material has resulted in the recent change.

The tautening and stiffening properties of a lacquer product are much greater than that of animal glue sizing; it also produces a lighter and better appearing product and has the rapid-drying advantage which is so desirable in this industry. Owing to the peculiar conditions and exacting requirements of hat manufacturers, it is imperative that they use a type of lacquer that is blush-proof, does not bridge, and has no objectionable odor.

There are several types of clear lacquers employed in this industry, among which are:

A water white clear lacquer size for use on white and light colored hats. These hats are usually made of visca braid.

A non-spotting lacquer—one that will not water spot—is used on dark braid of the Pedaline type.

The lacquer reducer should be of a high-boiling solvent type which does not blush readily, and it must be as nearly odorless as possible.

After the hat has been woven, it is dipped into water. It is then stained, dried and dipped into the lacquer sizing material. Usually this is a hand operation. The hats are then hung up to drain. After the drip has formed on the one edge, the hat is reversed and allowed to drain in this manner until it is thoroughly dried. It is

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Clear Crystal Lacquer Panel

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SPECIALIZED CLEANERS

Each different cleaning job presents different conditions and problems to be solved.

XCEM Specialized Cleaners are formulated and prepared to meet the requirements of these varying conditions.

Let us help you with your cleaning problems. It doesn't cost any more to do your cleaning operations right.

We guarantee that XCEM Products will do your cleaning quicker, better and at less cost. May we give a demonstration?

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then placed on a semi-heated mould to further accelerate the drying; the hat is shaped while it is on this heated mould.

The reduction of the lacquer in its application controls the relative deposit, and in this connection it is interesting to know that the brim of the hat is usually much stiffer than the crown, thereby requiring less reduction of the clear lacquer.

A novel application of lacquer on felt hats for a pleasing appearance is to apply a veiling lacquer enamel. This is a stipple product and it is applied with a spray gun. Satisfactory results can only be obtained by using a pressure-cup type of spray gun which usually requires very little pressure so that the materials being sprayed do not atomize. A large nozzle-opening on the gun is also important to procure desirable results. This novel finish is also applicable to purses, etc.—C. R. M.

New Denatured Alcohol

(Continued from page 30)

first objection modified; became accustomed to odor; did not further object.

"Additional test No. 5 diluted with water to precipitate resin and filtrate tasted for potability. Few drops only sufficient to give disagreeable bitter taste, precluding potability. Further tests being conducted on relative solubility of resins in No. 5 and because of presence of over 4 per cent sulphur in combined form in the alcotate, shellacs cut with alcohol containing this product will be stored in tin containers and aged to determine whether darkening or corrosion phenomena will occur.

"It is suggested that manufacturers experiment with product because of its non-toxic nature."

Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

High-Lighting Carved Furniture

I am finishing high priced carved furniture and have trouble in producing a good high-light that is not expensive. I have tried three different processes and none have given me the results I desire. I would very much appreciate your advice on this work for production.—S. M.

When water stain is used, I suggest the following method:

When the furniture comes to the finishing room in the white, use *a very fine shading gun* and stain the low places with a dark stain—being careful not to overlap the high places. This operation may be easily and quickly accomplished by a skilled spray operator if the proper gun is used.

Allow the piece to dry over night; then spray on a wash coat of shellac or a coat of lacquer sealer, depending upon the policies and schedule of the plant.

When dry, sand lightly, and at this time sand the high places more vigorously to remove any of the dark stain that may have overlapped.

Fill, wipe, and dry in the usual manner; then apply a coat of lacquer sealer or wash coat of shellac. If shellac is used, it should be very thin, provided the final coats are to be lacquer. When dry, apply the final coats of lacquer or varnish in the usual manner.

When lacquer shading stain is used:

This stain should be sprayed on the low places, using a very fine shading gun, and wiped off immediately because the lacquer stain dries almost as fast as it is applied. If any of this dark stain overlaps the high places, the helper at the stain booth can remove same with No. 00 steel-wool as the piece is being removed from the spray booth. The piece then proceeds as described above in water stain schedule.

Regarding the various species of wood, the same procedure is recommended for all kinds of wood. Of course, the filler will be mixed heavier for the porous woods—such as oak, ash, walnut, and mahogany. In most cases birch, maple, and gum will not need filling. It is best to weigh the filler in mixing and establish a definite practice for various woods on certain definite suites, thereby obtaining uniformity in color and final results.

Of course, the dark stain used will have to suit the various woods being finished; and the proper allowance for drying time should be made; but irrespective of whether the stain is a water, lacquer, or oil stain, the above procedure is recommended.

A little practice with the fine shading gun will convince you that it is possible to cut a very fine line with the proper adjustment of the air pressure and the gun.—P. C. Bardin.

Tumbling Small Wooden Discs

We have a quantity of small wooden discs about 2-in. in diameter and about ¾-in. thick to enamel or lacquer in red and black. (Similar to checkers.) We are informed that the tumbling barrel method is best for a smooth finish. Can you give us some information on this or the best way to finish these discs? They must be finished so as to slide easily. —N. R. S. L. Co.

I suggest finishing these small discs by the tumbling method, using a regular tumbling lacquer. (I prefer gum lacquer without any nitrocellulose.) Fill the tumbling barrel half full of the discs and pour in the tumbling lacquer. Tumble for 50 minutes. Then empty the discs on a tray or any flat pan to dry. When they have dried sufficiently, they will be tack free to handle.

To obtain good results in tumble finishing, fill the barrel only half full of the articles to be finished and then apply the lacquer. Never use too much material in one tumbling.—Geo. Moskos.

Mahogany Stain Fades

We have noticed that the mahogany finished pieces in our display room, when exposed to much sunlight, have a tendency to fade. Our designs are reproductions and are all hand turned from soft maple, tupelo and sap gum. We want a soft satin antique finish that is in keeping with pieces of this kind. The finishing process now used includes an oil stain followed immediately with a paste wood filler dissolved in leptyne or turpentine. This is allowed to dry 12 hours, and then the surface is given three coats of shellac, rubbing with fine steel wool between coats. The last coat, after the surface has been rubbed with steel-wool, is finished with a floor wax. When we first began to finish, the filler was applied before staining. Would this cause fading? Would a water stain give better results?—E. E. B. Co.

Oil stains are sure to fade and we believe you will find it better to use either a water stain or a stain made on a different basis, which has recently been put on the market.

The procedure then would be to apply one coat of this new permanent stain which can be followed with shellac or sealer within an hour. The alternative for a permanent color would be to use a water stain which should dry over night; then sandpaper the surface thoroughly before the next application.—James B. Day & Co.

The oil stained surfaces should dry over night, and filling (with paste wood filler) can follow on the next day. If paste wood filler is used over an oil stained surface before it has had time to dry, the filler will pick up some of the stain when the filler is cleaned off, thereby leaving a blotched and spotted surface.

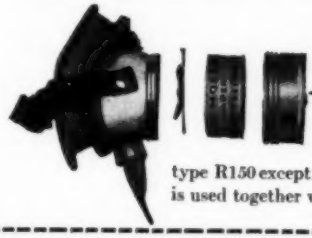
I would also suggest using naphtha or benzine instead of leptyne or turpentine for cutting the filler. The filler should dry at least 24

GOOD NEWS!

An elaborate broadside, illustrating and describing more than 25 different styles of respirators — offering sweeping PRICE REDUCTIONS—now available upon request! Mail Coupon Below. Get the utmost in nose, throat and lung protection — at minimum cost.

R150 Chemical Cartridge Respirator — One of PULMOSAN'S most famous types. Protects spray operators from fumes, mists and solids when spraying lacquers, enamels, varnish, lead paints, etc. Positive exhaust valve will not clog.

R100 Dustpruf Respirator — Made without outlet valve. Altho we recommend felt filter, we can supply with paper filter if desired.



R140 Chemical Cartridge Respirator—Similar to our type R150 except that a paper chemical cartridge is used together with an intake valve.

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176 Johnson St., Brooklyn, N. Y.

Gentlemen: Yes—mail me your new broadside, "Good News" showing the newest in respirators at reduced prices.

Name.....

Address.....

.....(I.F.)

hours. I generally use lacquer sealer because it gives a smooth surface, is durable, "sands" and "steel-wools" easily and is not expensive. All oil stain I know anything about will fade when exposed to sunlight. However, it is never wise to fill any surface before staining, because you will never get a true color or a uniform color, as you do by staining before filling.—T. R. Nall.

Composition Material in "Dev" Oak Finish

We are interested in "Dev" oak finish (August, 1930, page 69) and are wondering if it is practical to apply an antique finish of this style with lacquer on composition material.—C. D. Co.

Assuming that the "composition material" is a mixture of glue and sawdust, or a similar material such as used for imitation carvings, overlays, etc., the following procedure is recommended:

Mix 1-lb. of English crystals (mfr's. name on request) in three gallons of hot water. Of course this proportion may be varied to obtain the desired color. Spray on this stain and allow 24 hours drying time. Then spray on a brown shading stain (lacquer base). This shading stain should be as near a chestnut brown as it is possible to make it, and it should be sprayed in such a manner as to produce the desired antique effect. Allow five hours drying time.

Follow with a spray coat of half and half, white and orange shellac mixed very thin, (2-gal. alcohol to 1-gal. shellac). This coat will prevent the colors from bleeding through following coats. Allow five hours drying time. Next go over the work lightly with No. 00 steel wool, being careful to avoid picking up the shading stain in this operation. Then spray on one coat of gloss lacquer. After drying, if the work is slightly rough, use No. 5/0 sandpaper to smooth the surface. Spray on a coat of flat lacquer; after the surface is sufficiently dry it may be waxed.

If the nature of the work does not permit sanding, it is suggested that the gloss lacquer be omitted and that both lacquer coats be flat.

If you prefer to use oil stain I suggest you have a stain manufacturer match the water stain made with the English crystals. —P. C. Bardin.

Antique Finished Paper Screens

In the January issue, page 69, and inquiry appears by M.B.L. (manufacturer of folding screens made of wallpaper) about how to produce an "antique finish" on paper screens.

About five years ago an eastern varnish manufacturing company (name on request) put on the market an excellent Colonial wallpaper finish which was eagerly accepted by all the prominent decorating concerns doing high class work, particularly those specializing in period finishing. Although this product sold at $6.00 per gallon to large trade, it became very popular because it did produce a quite realistic antique effect, especially if the design on the paper was really appropriate so as to enhance the general effect.

Specialists along these lines

selected the right texture and figure of wallpaper appropriate for the different rooms; after being hung, the paper was brushed or sprayed with the varnish solution. When dry, the paper retained a somewhat deeper shade than formerly, but assumed a mellow and soft appearance as of aging which blended in perfect harmony with the ensemble of period furniture and furnishings in the room. The woodwork too was refinished to harmonize with the wallpaper.

The antiquing solution cannot be readily made by the finisher; in fact, it requires careful adjusting by the varnish manufacturer in order to produce and maintain a uniform finish. Although the decorator himself will not attempt to make this product, the formula for making it is as follows, so it may be submitted to a local varnish manufacturer to produce the material when required for some job.

In making the base varnish, run 25 gallons of china-wood oil with 25-lbs. of WW gum rosin to 525° F., hold to a string and then immediately add 30-lbs. of rosin broken into small pieces for quick solution in the hot batch. When this has melted, drop the heat to 450° F., work in 5-lbs. of litharge, and raise the heat to 560°F.; hold to body, then drop to 500° F., and add ½-lb. of manganese resinate, precipitate. Cool to 450°F. and reduce with 40 gallons of mineral thinner.

The flatting solution (stearated turpentine) is in the proportion of 1-lb. of alumina stearate combined with 1½ to 2 gallons of turpentine with heat to produce a heavy but perfectly clear jell.

Now the wallpaper finish itself:

NEW.....

An improved, electric portable belt surfacing machine for wood or metal.

Compact, simple, powerful, lightweight and fast, SKILSAW SANDER offers advantages never available before. It weighs only 18 lbs., is 7" x14" x9" high, perfectly balanced, convenient to handle and easy to use.

Finest abrasive belts furnished in all grits, are automatically centered and can be removed and changed in 10 seconds—SKILSAW SANDER gives an extra smooth finish. "RIPPLES" or uneven surfacing is impossible. Try it on your own work. A demonstration is free. Mail the coupon today.

SKILSAW SANDER specifications are:

Frame — Aluminum, die-cast for accuracy, strength and lightness.	Bearings—High-grade ball bearings throughout.
Motor—½ H.P. Universal for D.C. or A.C., 25-60 cycles.	Pulleys—2½" diameter.
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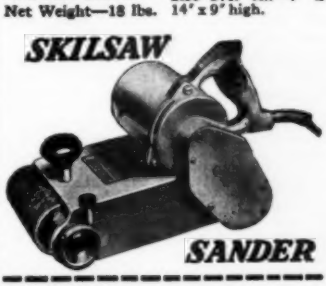

SKILSAW, Inc.,
3324 Elston Avenue, Chicago

Gentlemen: We will gladly watch a demonstration of SKILSAW SANDER without obligation on our part.

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THIS very snappy remark was originated by Joel Chandler Harris, one-time editor of the Atlanta Constitution and creator of the Uncle Remus stories. It very happily applies to the buyers of lacquers.

Practically every freshly sprayed product looks fine . . . . but when the weeks and months roll around and crazing, cracking, chipping, peeling, roll around with them—somebody catches it for hiding the fire. First the dealer gets it, then he passes it to you.

What a lacquer will do is in the lacquer when the drums come into your plant. If your product's finish stands up for ten years . . . that was in the lacquer, if it falls down in three months . . . it was in the lacquer.

Users of ALAKA, the Practical Lacquer, are not finding these difficulties. When you buy ALAKA you don't have to be a smoke-eater . . .

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CHICAGO BRANCH
2539 W. LAKE ST.
WEST 2043-4

Solution No. 1

Varnish .....4 gallons
Thinner .....1 gallon

Solution No. 2

Flattener .....1 gallon
Thinner .....1 gallon

The varnish should be reduced slowly to avoid curdling or clouding. The alumina stearate jelly should be carefully reduced to avoid lumpiness, and then added to the varnish, pouring it very slowly in a fine stream, and taking as much as about 30 minutes to do this. This slow addition of Solution No. 2 to the varnish prevents agglomeration, which will occur if it is added faster than the varnish can assimilate it.

Allow this combined mixture to stand about one hour or until proper consistency is effected; then reduce the mass with 5 gallons of mineral thinner. Much depends on the cooking (consistency) or the stearate jelly, and its action (the next day, when cold) on the varnish; likewise on the consistency of the mixture of Solution No. 1 and Solution No. 2, according to the length of time allowed for thickening before final thinning down.

Directions for the use of Colonial wallpaper finish is as follows: The package should first be shaken well before using. Apply with a soft brush, and liberally, to satisfy the paper; otherwise the application will not be uniform and may show variation due to the degree of absorption.

This product is intentionally made to produce only a very slight (almost nil) degree of sheen in order to give a softer and more delicate effect, and it is less liable to water spot. Too much sheen makes it difficult to apply without showing vulgar streaking. The

resultant finish is not waterproof, but has water-repellent properties. Water spattered onto its surface will evaporate and not leave a stain as would unfinished paper. I should say that the Colonial antique finish would probably be just what M.L.B. is seeking for his wallpaper screens.

If any of those screens are made with pine frames, I suggest the following method to produce an age-mellowed effect on new pine: After the wood is rubbed down with fine sandpaper and the dust removed, the pine woodwork is then brush-coated once or twice with strong ammonia. This will impart the peculiar yellowish color similar to the natural aged or antique appearance of pine wood after long exposure to light.

House painters, as a rule, do not depend on chemical formulas for such effects. Their usual method is to coat over the wood trim with a half-and-half mixture of boiled linseed oil and turpentine, and after this has soaked in for an hour or two, the entire surface is rubbed with cotton waste or a ball of cheesecloth. It is then given a second application of oil and turpentine, as before, to which is added a small quantity of raw sienna oil color paste. This should be applied with a sponge or piece of cotton waste and rubbed well into the wood. After allowing an hour or longer for the color to penetrate, the surface is rubbed dry with a clean cloth. Should the color be too clean and bright yellow, it may be toned down and made older looking by mixing a small amount of raw umber in oil (paste) to the above stain.

Care should be exercised in staining pine wood. Due to its

Banish this

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Are you risking a disastrous fire from accumulations of oils, turpentine, alcohol, etc., from leaking faucets in drums mounted the old way? Are your insurance rates higher because of that?

QUICKLY PAYS FOR ITSELF

It is impossible for faucets to leak when using Perfection Hangers as the drums can be swung to a vertical position. By reversing, the drums can be completely drained. Many have found they were losing as much as eight quarts in drum that were being returned as "empty." Stirring devices unnecessary. A drum of liquid in the hanger can be rocked vigorously with little effort, thus churning the contents and insuring a uniform mixture.

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Reduces by ½ the labor of refilling or handling drums. If you are handling liquids of any kind in drums, you are paying for Perfection Hangers.

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AN IMPROVED

Rubbing Flat Varnish

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1. SKINNING
   Can be sprayed from drum and remain uniform without sk n-ning.
2. TRANSPARENCY
   Is quite transparent not showing milky on dark finishes even on two coat work.
3. DRYING
   Dries to hard film over night.
4. RUBBING
   May be oil-rubbed over night.
5. SETTLING
   Flatting agent remains perfectly suspended giving uniformity of sheen.
6. BODY
   Has good full body.
7. SHEEN
   Furnished in four grades, varying from dead flat to light rubbed finish.
8. UNIFORMITY
   Varnish does not thicken on standing. Body and sheen remain uniform.

JAMESTOWN WOOD FINISHING COMPANY

JAMESTOWN, ... NEW YORK

New York City ..... Milwaukee, Wis.
Meriden, Conn. ..... Lenoir, N. C.

soft texture and absorptive nature, only a very small quantity of the oil stain is required; otherwise, the result will be a muddy effect. It is always advisable to first try out a new finish or a new batch of stain on a scrap piece of the same wood to determine the concentration of stain and the necessary manipulation to procure the exact color tone.

The wood is ready for the finishing coat after the oil in the stain has properly dried. Apply only a single thin coat of white shellac. After drying, moss it down lightly with fine steel-wool. A final waxing may follow, if desired.

As only a sealer coat of shellac is prescribed in order that the wood appear unfinished or natural, it is possible you may want a more waterproof finish than just plain shellac. A certain varnish manufacturing concern advertises a waterproof mixing for shellac. The company's claims (factful claims, I believe) are that when this compound is mixed with pure white shellac in the porportions recommended for different uses, it adds to the toughness and durability of the finish; will not turn white; softens the shellac luster; gives improved sealing qualities; flows freely from the brush and is otherwise easy to use; also, it has satisfactory sanding properties.—E. Perry.

Coating for Glass to Give Neon Effect

In the December issue of INDUSTRIAL FINISHING (pages 68, 70, 71 & 72) I replied to an inquiry regarding material to coat glass in imitation of Neon, the recommendation being to try a solution of sodium silicate as the binding vehicle.

Weather-OMeter

Science steps in with a new and better aid for the maker and user of Industrial Finishes—Weather-Ometer with its "Standardized Weathering." The manufacturer, whether makers of coach bodies or cabinet work for home furnishings, must know today the actual weathering qualities of the paints, lacquers, varnishes which he uses. Changes caused by the reactions of sun, rain, cold, heat, and humidity variations in any of these coatings must be known with absolute definiteness. Weather-Ometer by reproducing these factors, makes possible the study of their reactions on test panels coated with these materials. And accurate judgment can thus be made of their worth. Let us tell you the complete story. Send for Bulletin I. F. 2

We are also Creators and Distributors of Fade-Ometer—Standardized Sunlight; Launder-Ometer—Standardized Machine for Laboratory Washing Tests; Wear-Ometer—Standardized Wear Test Machine.

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ATLAS ELECTRIC DEVICES CO., INC.

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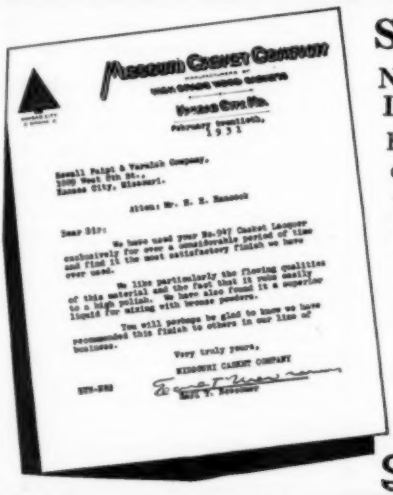
MISSOURI CASKET COMPANY

February [illegible], 1931

Sewall Paint & Varnish Company,
3200 West 9th St.,
Kansas City, Missouri.

Attn: Mr. E. E. Bennett

Dear Sir:

We have used your No. 947 Casket Lacquer exclusively for over a considerable period of time and find it the most satisfactory finish we have ever used.

We like particularly the flowing qualities of this material and the fact that it runs easily to a high polish. We have also found it a superior liquid for mixing with bronze powders.

You will perhaps be glad to know we have recommended this finish to others in our line of business.

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MISSOURI CASKET COMPANY

By E. Bennett

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Here is a lacquer made to do the job better. It is extremely easy flowing—leaves a high natural gloss which may or may not be buffed. It rubs easily to a high polish and is a superior liquid for mixing with bronze powders. For full information write:

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Your Product — Make it catch and charm the eye! — Make it compel admiration by its appearance! Then it will sell — and sell faster!

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Since that time the Patent Office has issued description of a material and process covering very closely certain of the same ideas that were expressed in that article. Because of this practical confirmation of my former suggested procedure, it would seem interesting to supplement that with an abstract of the new matter, therefore the following information from U. S. Patent 1,752,792 on a coating for application to glass which will give an opalescent effect:

"One hundred grams of kaolin (china clay), 50 grams of zinc phosphate, 15 grams of caustic soda, and 1000-cc of sodium silicate of specific gravity 1.025 are claimed as a mixture which is very efficient for use in electric lamp bulbs or similar glass objects. The original method of using an opal glass was expensive, and unsatisfactory because under the high heat there were certain decompositions which shortened the bulb life. Etching of the glass by hydrofluoric acid gave diffusion but not opalescence, and decreased the light efficiency.

"The present mixture absorbs less light, does not affect the bulb strength, flows easily so it is a simple matter to coat the bulb interior, and aids in sealing the glass. Other binders have been tried but shrinkage on drying set up powerful stresses in the glass which weakened the bulb; the use of silicate at this dilution gives sufficient binding action without this secondary effect on the glass. The silicate, when dehydrated, acts also as a pigment. If a colored coating is desired, the color may be added and the amount of filler proportionately decreased to maintain the proper consistency.

"The coating is applied by spraying or flushing into the bulb; the

excess is removed by draining or a vacuum, and this is followed by subjecting to a relatively high heat to produce instantaneous setting. Baking for three or four minutes at 572°F. to dehydrate the binder, completely solidify the coating, and remove occluded gases, finishes the job. The coating is entirely permanent, although it can be removed by abrading and flushing with water if that should become necessary."—E. Perry.

True success in life is measured by the service rendered to our fellowmen. Measured in those terms, the paint industry is not the least among the multifarious activities of our complex civilization.

Colors Popular for Automobiles

According to the February issue of "Automobile Color Index" published monthly by the Duco Color Advisory Service: Black's leadership as an automobile finish has been destroyed by blue after six months of supremacy. The wane of black's popularity in the textile, as well as the automobile industry has been evident for many months.

Blue is showing a definite upward movement while black continues to decline. Serge blue has gained rapid acceptance and heads the list of leaders in the blue group, indicating that deep blues are still very much in favor.

Maroon has climbed rapidly during the last 90 days and has gained prominence this month by surpassing both brown and green. Maroon is now third in importance for the first time on record.

In spite of green's abrupt decline last month, it is not anticipated that this hue's relegation to fourth place will endure for long because of the strong current interest displayed in green as evidenced by the prevalence of this hue on cars exhibited at the 1931 national automobile shows where green was second in importance to black.

Brown continues to decline moderately.

Grey is commencing a new upward movement. Soft, greenish English grey has returned to prominence as this month's leader.

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Solutions of **Soligens** prepared simply with volatile solvents and thinners have remained clear and in solution (no setting) for two years. Think it over, we will be glad to help you with your problems.

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EXPLOSION-PROOF ELECTRIC MIXERS

Clamp to *any* tank and mix *all* liquids

MIX QUICKER

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AUTOMOTIVE FINISHING COMPLETELY COVERED

A detailed study of modern methods of automobile painting; carefully written in non-technical terms. This book contains much useful information, both for the shop owner and finisher; explaining methods of preventing checking and cracking, water spotting, peeling, chipping, flaking and many other helpful ideas.

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16 CHAPTERS.....PRICE $3.00

Remittance with order, please

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Fireproof Equipment

Fireproof transfer pumps are the thing to use in handling liquids of a volatile nature—and most modern materials fall more or less within this list. If there is one thing the finishing department cannot afford to do, it is to take unnecessary chances with fire. There must be no drip from the spouts of these appliances, if we are to call them effective, and there must be an efficient fire baffle that will prevent fire from entering the drum, even though by some sad chance it should occur on the outside. It is to be noted with satisfaction that some finishing departments are equipped with very good pumps, which include these features.—J. E. H.

Opening Sealed Drums

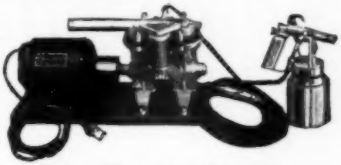
And now, along with other developments, we find a new drum (for paints and varnishes) that has an easily removable cover, yet one which can be sealed liquid-tight in less than a minute. The cover is simplicity itself; it can be pried off with a pointed tool. The drum can be resealed, but must be supplied with a new cover before it can be used again for shipping.—W. B. M.

Hercules Establishes Foreign Relations Department

A new department to be called the "Foreign Relations Department" has been instituted by the Hercules Powder Co., Wilmington, Dela., according to an announcement by Russell H. Dunham, president. Mr. Peter W. Meyeringh will be in charge of the new department. Until recently Mr. Meyeringh was manager of the Hercules European Connection, the N. V. Hercules Powder Co., at Rotterdam, Holland. The purpose of the new department, according to Hercules officials, will be to coordinate sales and the development of new business in foreign lands.

This coupon will bring you the reasons why SUPER SPRA-MORE "55" reduces finishing costs

If spray painting with portable equipment meet your needs, we'd like to give you the facts abou the Super Spra-more "55" as they apply to *your* kind of a job . . . showing you how you can effect substantial savings in the finishing of your product . . . telling you what other manufacturers with similar problems have done toward reducing finishing costs with the Super Spra-more "55". These facts may give you the secret of making extra profit by lowering time and material costs in this phase of your manufacturing process. There is no obligation—simply fill out the coupon below.



Price, Complete $78.50

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Gentlemen,
Kindly send me details of Super Spra-more "55" and information concerning its use in the finishing of our product.

Name.....

Address.....

Type of Product.....

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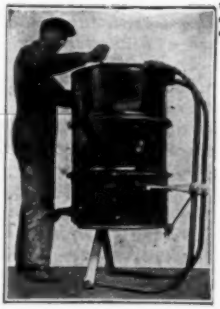
Stocks of Crown Equipment carried in Eastern and Middle Western States



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EDITORIAL

Spray Painting Legislation

From time to time there are introduced into state legislatures bills designed to prohibit, or seriously curtail the use of the modern spraying equipment for applying paints and finishing materials to surfaces to be painted, finished or decorated. A recent case to point appeared in Texas wherein H. B. No. 265 was introduced.

So far as we are able to find out no State has passed a law relating to spray painting, notwithstanding the scores of attempts to do so upon the part of a certain unprogressive and minority element in the hand-brush painters' union, who, for economic reasons and against the public interest, object to any labor-saving device, but seek to impose their costly and obsolete methods upon the property owners, taxpayers, industries and consumers.

This bill was introduced, we understand, in the interest of the hand-brush painters' union. Previous sessions of the Texas Legislature overwhelmingly refused to pass such unwise prohibitory legislation disguised as a regulatory measure. Its origin, and the self-interested aims of its sponsors, are sufficient to brand the bill as mischievous. The bill purports to be regulatory by prescribing so-called safeguards and working conditions, together with the requirement of registration of its users with the Labor Commissioner at a certain fee therefore; it is prohibitory of spray painting and finishing or refinishing of industrial products by prescribing impossible conditions as its advocates intended to accomplish. Such a bill would greatly increase the cost of every product having a finished surface. It should be borne in mind that the proposal comes from those who, generally, do not use this cost-saving painting device and who know nothing of its merits or its operation.

In similar but unsuccessful efforts, in Texas and numerous other States, to prevent the use of this labor-saving device for quicker, cheaper and better painting, there has been advanced the groundless claim of a health hazard, yet in no case has proof of injury to any spray painter been proved.

It has not been shown by experience that spray painting is any more hazardous to health than other painting methods; in every case of lead poisoning among painters, it has been a brush painter and not a spray painter, according to official records. Past efforts to prevent the spray painting process and compel the use of traditional hand-brush methods requiring 3 to 10 men to do the work

of one sprayer, and the destructive provisions of Texas House Bill 265, proves insincerity in the so-called protection of the health of spray operators—an appealing argument to the credulous and uninformed, but certainly not to anyone familiar with the facts of spray painting.

After carefully reading Texas H. B. 265, the publishers of INDUSTRIAL FINISHING drafted and forwarded a night letter to the Texas legislature at the State House in Austin, Texas, to the effect that:

"We believe that house bill number two hundred sixty five clearly implies gross prejudice against and needless burden upon users of the method of painting and finishing that is universally employed in industry and which is generally recognized as being practical, safe and a tremendous improvement over old costly methods."

Tooling up Factory For New Products

Management in many manufacturing establishments is in a state of unrest. Manufacturers are casting about for new products, in their own and allied fields, in an effort to hit upon something that is marketable at a profit. It is a laudable attempt based on the natural law of self preservation.

Some of these experiments—these flights in industry—will prove profitable; others will require a lot of elimination of overhead to keep the concerns "out of the red." A plant that is manned, equipped and tooled up to produce case goods or millwork will require more than just executive conversation or some conjuring with figures to show a profit if the firm's output is suddenly changed to wood toys or midget radio cabinets. The very plant layout often becomes a hindrance and burden to the new line of production.

Take for instance a factory designed and laid out to turn out 700 regulation size radio cabinets daily. The finishing department covers approximately 25,000-sq.ft. of floor space, with the rest of the plant in relative proportion. Imagine producing 1,000 or even 2,000 midget radio sets, or 10,000 small picture frames daily. Even this comparatively large production would not require a finishing department of such proportions. Fully as much time would be consumed in handling and trucking as in actual finishing. The burden of overhead, based on the area of floor space occupied, would be greater than a small, low-priced commodity could bear.

The wise manufacturer will consider the proposition from all angles before he changes his line of production. Departments, equipment and supervision will need to be condensed to fit the unit size of the new product and the volume of output per week. In other words, the manufacturer will need to design and cut his garment according to the cloth, for only in this way, will he show a profit.

Bitumen is a basic product used in the manufacture of paint, enamel, and varnish. In commercial language bitumen is classed under three heads—petroleum, oil, and asphalt, it is found in one of these forms in almost every land on the globe and is being utilized in various ways commercially.

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